```
=> e spangler brenda/au
E1            3     SPANGLER B E/AU
E2            6     SPANGLER BABETTE/AU
E3            5 --> SPANGLER BRENDA/AU
E4           28     SPANGLER BRENDA D/AU
E5            1     SPANGLER BRENDA DOLGIN/AU
E6            1     SPANGLER BRUCE A/AU
E7            1     SPANGLER BURTON H/AU
E8           32     SPANGLER C/AU
E9            3     SPANGLER C A/AU
E10           7     SPANGLER C C/AU
E11           4     SPANGLER C D/AU
E12           8     SPANGLER C E/AU

=> s e3-e5
L1           34 ("SPANGLER BRENDA"/AU OR "SPANGLER BRENDA D"/AU OR "SPANGLER
                BRENDA DOLGIN"/AU)

=> dup rem l1
PROCESSING COMPLETED FOR L1
L2           30 DUP REM L1 (4 DUPLICATES REMOVED)

=> d bib ab 1-
YOU HAVE REQUESTED DATA FROM 30 ANSWERS - CONTINUE? Y/(N):y


L2   ANSWER 1 OF 30  CAPLUS  COPYRIGHT 2005 ACS on STN
AN   2005:158490  CAPLUS
DN   142:235999
TI   Biosensors utilizing dendrimer-immobilized ligands and their use thereof
IN   Spangler, Brenda D.; Spangler, Charles W.
PA   Montana State University, USA
SO   PCT Int. Appl., 45 pp.
     CODEN: PIXXD2
DT   Patent
LA   English
FAN.CNT 1
     PATENT NO.          KIND   DATE        APPLICATION NO.        DATE
     --------------      ----   --------    -------------------    --------
PI   WO 2005016115        A2    20050224    WO 2004-US1961         20040123
         W:  AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH,
             CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD,
             GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC,
             LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI,
             NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY,
             TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VC, VN, YU, ZA, ZM, ZW
         RW: BW, GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ,
             BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE,
             ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK,
             TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG
PRAI US 2003-442270P      P     20030123
AB   The present invention is directed to methods and compns. useful as
     biosensors that specifically interact with various pathogens and other
     target analytes.  The biosensor itself comprises functionalized dendritic
     tethers derivatized for attachment to a variety of surfaces as
     self-assembled monolayers (SAMs) as well as attached binding moieties
     (sometimes referred to as capture binding ligands).  Accordingly, the
     present invention provides compns. comprising supports comprising surfaces
     to which the binding moieties (e.g. antibodies) are attached for the
     detection of target analytes (e.g. pathogens) as well as methods and
     compns. relating to the attachment of such binding moieties.

L2   ANSWER 2 OF 30  CAPLUS  COPYRIGHT 2005 ACS on STN DUPLICATE 1
AN   2004:943081  CAPLUS
DN   142:5083
TI   Comparison of Antibody-Antigen Interactions on Collagen Measured by
     Conventional Immunological Techniques and Atomic Force Microscopy
AU   Avci, Recep; Schweitzer, Mary; Boyd, Robert D.; Wittmeyer, Jennifer;
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Steele, Andrew; Toporski, Jan; Beech, Iwona; Arce, Fernando Teran; **Spangler, Brenda**; Cole, Kelly M.; McKay, David S.
CS Department of Physics, Montana State University, Bozeman, MT, 59715, USA
SO Langmuir (2004), 20(25), 11053-11063
CODEN: LANGD5; ISSN: 0743-7463
PB American Chemical Society
DT Journal
LA English
AB We have developed a means of using atomic force microscopy (AFM) to repeatedly localize a small area of interest (4 + 4 μm2) within a 0.5-cm2 area on a heterogeneous sample, to obtain and localize high-resolution images and force measurements on nonideal samples (i.e., samples that better reflect actual biol. systems, not prepared on atomically flat surfaces). We demonstrate the repeated localization and measurement of unbinding forces associated with antibody-antigen (ab-ag) interactions, by applying AFM in air and in liquid to visualize and measure polyclonal ab-ag interactions, using chicken collagen as a model system. We demonstrate that mol. interactions, in the form of ab-ag complexes, can be visualized by AFM when secondary antibodies are conjugated to 20-nm colloidal gold particles. We then compare those results with established immunol. techniques, to demonstrate broader application of AFM technol. to other systems. Data from AFM studies are compared with results obtained using immunol. methods traditionally employed to investigate ab-ag interactions, including ELISA, immunoblotting, and in situ immunofluorescence. Finally, using functionalized AFM tips with a flexible tether [poly(ethylene glycol) 800] to which a derivatized antibody was attached, we analyzed force curve data to measure the unbinding force of collagen antibody from its antigen, obtaining a value of .apprx.90 ± 40 pN with a MatLab code written to automate the analyses of force curves obtained in force-volume mode. The methodol. we developed for embedded collagen sections can be readily applied to the investigation of other receptor-ligand interactions.
RE.CNT 45 THERE ARE 45 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L2 ANSWER 3 OF 30 CAPLUS COPYRIGHT 2005 ACS on STN
AN 2004:229294 CAPLUS
TI Design and synthesis of dendritic tethers for the immobilization of antibodies for the detection of Class A bioterror pathogens
AU Spangler, Charles W.; **Spangler, Brenda D.**; Tarter, E. Scott; Suo, Zhiyong
CS SensoPath Technologies, Inc, Bozeman, MT, 59715, USA
SO Abstracts of Papers, 227th ACS National Meeting, Anaheim, CA, United States, March 28-April 1, 2004 (2004), POLY-659 Publisher: American Chemical Society, Washington, D. C.
CODEN: 69FGKM
DT Conference; Meeting Abstract
LA English
AB It is imperative that detection protocols for bioterror pathogens can be used by first responsers and that requirements for sophisticated, expensive instrumentation be minimized. SensoPath Technologies is developing approaches for immobilization of antibodies and other types of proteins on a variety of surfaces, including gold, glass, and quartz. The focus is on protocols for the detection of Class A pathogenic agents and food- and water-borne bacterial and viral pathogens. The immobilization step employs dendritic tethers utilizing multivalent attachments yielding extremely robust bioactive surfaces. We are developing immobilization techniques for polyclonal, monoclonal, and recombinant antibodies as well as functionalizing proteins for attachment to the dendritic tethers. The goal of the new technol. is to supply reagents for hand-held instruments using surface plasmon resonance and quartz crystal microbalance biosensing, as well as deployment of a fluorescent probe detection system for first responders. We envision several addnl. applications in fundamental biomedical research.

L2 ANSWER 4 OF 30 CAPLUS COPYRIGHT 2005 ACS on STN
AN 2004:234400 CAPLUS
DN 141:361608

TI Design and synthesis of dendritic tethers for the immobilization of antibodies for the detection of class A bioterror pathogens
AU Spangler, Charles W.; **Spangler, Brenda D.**; Tarter, E. Scott; Suo, Zhiyong
CS SensoPath Technologies, Inc., Bozeman, MT, 59715, USA
SO Polymer Preprints (American Chemical Society, Division of Polymer Chemistry) (2004), 45(1), 524-525
CODEN: ACPPAY; ISSN: 0032-3934
PB American Chemical Society, Division of Polymer Chemistry
DT Journal; (computer optical disk)
LA English
AB A new type of biosensor surface that derives its effectiveness from immobilized antibodies directed against protein toxins expressed by bioterror pathogens was designed, synthesized and tested. These antibodies can be immobilized on a variety of detector surfaces using unique dendritic tethers that exhibit a remarkable degree of design flexibility, and can be incorporated in a wide variety of detector systems. In the first step, the length of the spacer groups terminating in SH tether groups is introduced which provides variable flexibility. A rigid rod component is then introduced to provide chain stiffening in the mid-section of the immobilization agent to prevent the construct from folding back on itself. The last step involves the final assembly of the immobilization reagent incorporating multiple thiol tether groups and antibody immobilization functionality. The new system can be used to detect not only class A bioterror pathogens, such as anthrax, plague, tularemia and botulinum toxin, but any pathogenic agent for which an antibody can be obtained.
RE.CNT 7 THERE ARE 7 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L2 ANSWER 5 OF 30 CAPLUS COPYRIGHT 2005 ACS on STN
AN 2004:230859 CAPLUS
DN 141:310098
TI Detection and localization of antibody-antigen interactions with high spatial resolution on collagen tendons
AU Boyd, Robert D.; Avcl, Recep; Schweitzer, Mary; Wittmeyer, Jennifer; **Spangler, Brenda**; Thieltges, Kate M.
CS Department of Physics, Montana State University, Bozeman, MT, USA
SO Polymeric Materials Science and Engineering (2004), 90, 268-269
CODEN: PMSEDG; ISSN: 0743-0515
PB American Chemical Society
DT Journal; (computer optical disk)
LA English
AB Atomic force microscopy (AFM) was employed to measure the unbinding force of antibody-antigen pairs. A section of collagen tendon was used as a representative system to determine if specific antibody-antigen interactions can be detected. In addition, by varying the x-y position of the AFM tip, the spatial distribution of the interactions can be determined AFM force curves taken from collagen tendons fall into two groups, first, showed either no interaction or non-specific adhesion and are of no interest in this case, and second group showed specific interactions. Results show that AFM can be used to detect antibody-antigen interactions on actual biol. samples and be able to map the distribution of the interactions with tens of nanometer resolution
RE.CNT 5 THERE ARE 5 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L2 ANSWER 6 OF 30 CAPLUS COPYRIGHT 2005 ACS on STN
AN 2004:228316 CAPLUS
TI Detection and localization of antibody-antigen interactions with high spatial resolution on collagen tendons
AU Boyd, Robert D.; Avci, Recep; Schweitzer, Mary; Wittmeyer, Jennifer; **Spangler, Brenda D.**; Thieltges, Kate
CS ICAL, Department of Physics, Montana State University, Bozeman, MT, 59717, USA
SO Abstracts of Papers, 227th ACS National Meeting, Anaheim, CA, United States, March 28-April 1, 2004 (2004), PMSE-162 Publisher: American Chemical Society, Washington, D. C.

CODEN: 69FGKM
DT Conference; Meeting Abstract
LA English
AB Measuring ligand receptor forces using the atomic force microscope as a force-sensing instrument has been well documented. For example in the detection of antibody-antigen interactions with the antibody attached to the AFM tip. The vast majority of these studies use idealized systems, such as individual antibodies adsorbed onto a well-defined substrate. Little work has been done on the investigations on biol. systems more representative of actual -real-life' situations. It has been demonstrated that antibody - antigen interactions can be detected on collagen tendons with an unbinding force of 90 ± 20 pN. The anal. was complicated by signals arising from not only from antibody-antigen interactions but also from the pulling of the collagen fibrils by the AFM tip. In addition, by moving the AFM tip laterally the spatial distribution of the interactions could be determined a resolution of a hundred nanometers showing a non-uniform distribution of events across the tendon.

L2 ANSWER 7 OF 30 CAPLUS COPYRIGHT 2005 ACS on STN
AN 2003:629791 CAPLUS
TI Pathogen detection using bioactive dendritic tethers
AU **Spangler, Brenda D.**; Hyman, Deborah A.; Tarter, E. Scott; Spangler, Charles W.
CS Department of Chemistry and Biochemistry, Montana State University, Bozeman, MT, 59717, USA
SO Abstracts of Papers, 226th ACS National Meeting, New York, NY, United States, September 7-11, 2003 (2003), ANYL-132 Publisher: American Chemical Society, Washington, D. C.
CODEN: 69EKY9
DT Conference; Meeting Abstract
LA English
AB Biosensors require stable, selective, and specific biosurfaces to capture analytes and provide rapid responses, particularly in the hands of first responders to a bioterrorist attack. We designed and tested a model system consisting of a novel, very stable multifunctional dendritic tether self-assembled on a gold-coated surface plasmon resonance chip then derivatized with anti-anthrax antibodies for real-time detection of anthrax toxin PA subunit. The tethers can be custom tailored for various sensor applications. Coupling of protein is accomplished by oxidizing naturally occurring sugars on polyclonal or monoclonal antibodies to form aldehydes that react with a hydrazide-terminated SAM. For antibodies or proteins not naturally glycosylated, we engineered a promiscuous recombinant O-glycosyltransferase that transfers oxidizable sugars to serine or threonine residues. In this way, PA was glycosylated and covalently bound to a dendritic SAM to detect serum antibody by SPR, making it a convenient method to survey victims' blood for exposure to pathogens.

L2 ANSWER 8 OF 30 CAPLUS COPYRIGHT 2005 ACS on STN
AN 2003:178726 CAPLUS
TI Multifunctional dendritic tethers for detection of bioterror pathogens by surface plasmon resonance
AU **Spangler, Brenda D.**; Hyman, Deborah A.; Tarter, E. Scott; Spangler, Charles W.
CS Department of Chemistry and Biochemistry, Montana State University, Bozeman, MT, 59717, USA
SO Abstracts of Papers, 225th ACS National Meeting, New Orleans, LA, United States, March 23-27, 2003 (2003), ANYL-017 Publisher: American Chemical Society, Washington, D. C.
CODEN: 69DSA4
DT Conference; Meeting Abstract
LA English
AB The lack of rapid detection protocols for bioterrorism agents, particularly at the point of attack, was clearly demonstrated during the recent rash of anthrax attacks and hoaxes in the Fall of 2001. Deaths from exposure to anthrax or other pathogens may be preventable for first responders if the presence and identity of the pathogen can be quickly determined We have developed a new approach to the design of self-assembled

monolayers (SAMs) based on multivalent dendrimers capable of immobilizing antibodies for detection of a variety of bacterial protein toxins, the specific and rapidly expressed virulence factors directly responsible for disease and death. Recombinant, monoclonal or polyclonal antibodies against the selected toxins are derivatized with a unique functional group. The dendritic tether can be assembled on a gold surface and the derivatized antibody attached in a short time period, providing a rapid, highly selective and specific chip suitable for pathogen detection in a portable surface plasmon resonance sensor.

L2 ANSWER 9 OF 30 BIOSIS COPYRIGHT (c) 2005 The Thomson Corporation on STN
AN 2003:521396 BIOSIS
DN PREV200300523075
TI Pathogen detection using bioactive dendritic tethers.
AU **Spangler, Brenda D.** [Reprint Author]; Hyman, Deborah A. [Reprint Author]; Tarter, E. Scott; Spangler, Charles W. [Reprint Author]
CS Department of Chemistry and Biochemistry, Montana State University, Bozeman, MT, 59717, USA
uchbs@montana.edu; uchbs@montana.edu; uchbs@montana.edu
SO Abstracts of Papers American Chemical Society, (2003) Vol. 226, No. 1-2, pp. ANYL 132. print.
Meeting Info.: 226th ACS (American Chemical Society) National Meeting. New York, NY, USA. September 07-11, 2003. American Chemical Society.
ISSN: 0065-7727 (ISSN print).
DT Conference; (Meeting)
Conference; Abstract; (Meeting Abstract)
LA English
ED Entered STN: 5 Nov 2003
Last Updated on STN: 5 Nov 2003

L2 ANSWER 10 OF 30 BIOSIS COPYRIGHT (c) 2005 The Thomson Corporation on STN
AN 2003:369806 BIOSIS
DN PREV200300369806
TI Multifunctional dendritic tethers for detection of bioterror pathogens by surface plasmon resonance.
AU **Spangler, Brenda D.** [Reprint Author]; Hyman, Deborah A. [Reprint Author]; Tarter, E. Scott; Spangler, Charles W.
CS Department of Chemistry and Biochemistry, Montana State University, Bozeman, MT, 59717, USA
uchbs@montana.edu
SO Abstracts of Papers American Chemical Society, (2003) Vol. 225, No. 1-2, pp. ANYL 17. print.
Meeting Info.: 225th American Chemical Society (ACS) National Meeting. New Orleans, LA, USA. March 23-27, 2003. American Chemical Society.
ISSN: 0065-7727 (ISSN print).
DT Conference; (Meeting)
Conference; Abstract; (Meeting Abstract)
LA English
ED Entered STN: 13 Aug 2003
Last Updated on STN: 13 Aug 2003

L2 ANSWER 11 OF 30 BIOSIS COPYRIGHT (c) 2005 The Thomson Corporation on STN
AN 2001:546566 BIOSIS
DN PREV200100546566
TI Comparison of the Spreeta(R) surface plasmon resonance sensor and a quartz crystal microbalance for detection of Escherichia coli heat-labile enterotoxin.
AU **Spangler, Brenda D.** [Reprint author]; Wilkinson, Elisabeth A.; Murphy, Jesse T.; Tyler, Bonnie J.
CS Department of Chemistry and Biochemistry, Montana State University, Bozeman, MT, 59717, USA
uchbs@montana.edu
SO Analytica Chimica Acta, (12 October, 2001) Vol. 444, No. 1, pp. 149-161. print.
CODEN: ACACAM. ISSN: 0003-2670.
DT Article

LA English
ED Entered STN: 21 Nov 2001
Last Updated on STN: 25 Feb 2002
AB Small, low-cost sensors that rapidly detect pathogens or their toxic products in food and water supplies would facilitate environmental monitoring. However, they must be sufficiently easy to use and reliable enough to be widely deployed. In this study, a small surface plasmon resonance sensor (Spreeta(R) SPR) and a quartz crystal microbalance (QCM) have been evaluated to determine whether the sensitivity, reliability, and ease of operation of one or both devices would be suitable for flow-cell format detection of pathogenic agents. Both make use of a gold-coated surface modified by deposition of a suitable capture agent. In each case, analyte binding to the capture agent results in a quantifiable signal. The model system consisted of Escherichia coli heat-labile enterotoxin (LT), responsible for travelers' diarrhea, and its receptor analog, ganglioside GM1. Each device provided a roughly proportional response in a range between 3 (35 pmol) and 25 mug (300 pmol) of toxin protein, but began to saturate the adlayer of capture agent at higher toxin concentrations. The Spreeta(R) SPR produced a significant response to 6 mug (70 pmol) of E. coli enterotoxin, while the QCM device produced a measurable response to 3 mug (35 pmol) of E. coli enterotoxin. The two devices are comparable with respect to ease of operation and reliability. Both devices could be suitable for remote sensing of analyte from a flow stream with suitable enclosures and temperature-controlled buffering to prevent artifacts induced by temperature fluctuation. There appear to be no significant differences between the Spreeta(R) SPR device compared to a QCM device as a small, low-cost, rapid biodetector. While neither device matches the sensitivity of enzyme-linked immunosorbant assay (ELISA) for detection of picograms amounts of analyte, measurements can be obtained directly, in minutes, rather than the hours required to visualize results of an ELISA.

L2 ANSWER 12 OF 30 CAPLUS COPYRIGHT 2005 ACS on STN
AN 2000:326997 CAPLUS
TI Evaluation of small-scale quartz-crystal microbalance and surface-plasmon-resonance biosensors for detection of bacterial pathogens.
AU **Spangler, Brenda D.**; Wilkinson, Elizabeth A.
CS Department of Chemistry and Biochemistry, Montana State University, Bozeman, MT, 59717, USA
SO Book of Abstracts, 219th ACS National Meeting, San Francisco, CA, March 26-30, 2000 (2000), ANYL-203 Publisher: American Chemical Society, Washington, D. C.
CODEN: 69CLAC
DT Conference; Meeting Abstract
LA English
AB Small, low-cost sensors that rapidly detect pathogens or their toxic products in food and water supplies would facilitate environmental monitoring, provided they were sufficiently easy to use and reliable enough to be widely deployed. Two potential technologies have been evaluated: a quartz crystal microbalance device and a surface plasmon resonance biosensor. Both are miniaturized and capable of portability, can be used in a flow-cell format, and make use of a gold-coated surface that can be modified by deposition of a suitable capture agent or mol. trap. In each case, analyte binding to the capture agent results in a quantifiable signal. We used the Escherichia coli heat-labile enterotoxin (LT) responsible for travelers' diarrhea, and its receptor analog, ganglioside GM1, to evaluate these two technologies for their utility in field conditions. Issues examined include specificity, sensitivity, longevity of the coated sensor surface, reproducibility, rapid quantitation and versatility.

L2 ANSWER 13 OF 30 BIOSIS COPYRIGHT (c) 2005 The Thomson Corporation on STN
AN 2000:180947 BIOSIS
DN PREV200000180947
TI Evaluation of small-scale quartz crystal microbalance and surface plasmon resonance biosensors for detection of bacterial pathogens.
AU **Spangler, Brenda D.** [Reprint author]; Wilkinson, Elizabeth A.

[Reprint author]
CS Department of Chemistry and Biochemistry, Montana State University, Bozeman, MT, 59717, USA
SO Abstracts of Papers American Chemical Society, (2000) Vol. 219, No. 1-2, pp. ANYL 203. print.
Meeting Info.: 219th Meeting of the American Chemical Society. San Francisco, California, USA. March 26-30, 2000. American Chemical Society.
CODEN: ACSRAL. ISSN: 0065-7727.
DT Conference; (Meeting)
Conference; Abstract; (Meeting Abstract)
LA English
ED Entered STN: 11 May 2000
Last Updated on STN: 4 Jan 2002

L2 ANSWER 14 OF 30 BIOSIS COPYRIGHT (c) 2005 The Thomson Corporation on STN
AN 2000:33190 BIOSIS
DN PREV200000033190
TI Capture agents for a quartz crystal microbalance-continuous flow biosensor: Functionalized self-assembled monolayers on gold.
AU **Spangler, Brenda D.** [Reprint author]; Tyler, Bonnie J.
CS Department of Chemistry and Biochemistry, Montana State University, Bozeman, MT, 59717, USA
SO Analytica Chimica Acta, (Nov. 8, 1999) Vol. 399, No. 1-2, pp. 51-62. print.
CODEN: ACACAM. ISSN: 0003-2670.
DT Article
LA English
ED Entered STN: 19 Jan 2000
Last Updated on STN: 31 Dec 2001
AB For a model system, we used gangliosides as capture agents on the gold electrode surface of a quartz crystal microbalance (QCM) to detect cholera toxin (CT) and the closely-related Escherichia coli heat-labile enterotoxin (LT) in a continuous-flow cell. Positive signals were verified by introduction of anti-CT and anti-LT antibodies. Antibody binding to captured analyte was corroborated by positive signals from the binding of appropriate anti-immunoglobulin antibody in a manner analogous to a solid-phase enzyme-linked immunoassay (ELISA). While ganglioside receptor analogs are stable, easy to apply and have high affinity for particular bacterial toxins, they have the disadvantage of binding endogenous materials likely to be found in a biological sample. To avoid this problem, we have devised a self-assembled monolayer (SAM) on gold that can be modified with a functional group able to covalently bind and orient immunoglobulins without loss of antibody binding activity. We present preliminary results demonstrating the formation of the SAM linker terminating in a hydrazide functionality. The hydrazide was used to link active antibody against E. coli O 157:H7 to the self-assembled monolayer. The antibody-derivatized QCM detected E. coli O 157:H7 at concentrations of 107 and 104 cells per ml through a flow-cell. Antibody capture agents provide exquisite specificity, sensitivity and an essentially unlimited range of capture agents that can be coupled to the QCM for analytical purposes.

L2 ANSWER 15 OF 30 CAPLUS COPYRIGHT 2005 ACS on STN
AN 1997:230019 CAPLUS
TI A portable, rapid biosensor for pathogenic agents.
AU **Spangler, Brenda D.**; Ballantine, David S.
CS Department Chemistry and Biochemistry, Montana State University, Bozeman, MT, 59717, USA
SO Book of Abstracts, 213th ACS National Meeting, San Francisco, April 13-17 (1997), BTEC-033 Publisher: American Chemical Society, Washington, D. C.
CODEN: 64AOAA
DT Conference; Meeting Abstract
LA English
AB Travel to areas of high disease prevalence brings many unprotected travelers in contact with a wide variety of pathogenic agents, which can then be easily transported anywhere in the world. War and civil unrest with their ensuing population dislocation provide ample opportunity for

dissemination of both old and new pathogens. A rapid, portable, easy to use sensor that will detect one or more specific pathogenic agents at the outbreak site, in real time, would provide essential information for prevention of disease spread and for timely, effective treatment. We have designed a biosensor based on a quartz-crystal microbalance that can be used to detect one or an array of biol. agents using recognized receptor-ligand and antibody-antigen interactions. The device can sequentially refine a diagnostic signal by means of specific antibodies to identify captured analytes. Data will be presented to show sensitivity, specificity and reproducibility of bacterial enterotoxin detection in buffer solns., stool, and fluid samples.

L2 ANSWER 16 OF 30 CAPLUS COPYRIGHT 2005 ACS on STN DUPLICATE 2
AN 1995:779827 CAPLUS
DN 123:163085
TI The three-dimensional crystal structure of cholera toxin
AU Zhang, Rong-Guang; Scott, David L.; Westbrook, Mary L.; Nance, Sharon; **Spangler, Brenda D.**; Shipley, G. Graham; Westbrook, Edwin M.
CS Center for Mechanistic Biol. and Biotechnol., Argonne Natl. Lab., Argonne, IL, 60439, USA
SO Journal of Molecular Biology (1995), 251(4), 563-73
CODEN: JMOBAK; ISSN: 0022-2836
PB Academic
DT Journal
LA English
AB The clin. manifestations of cholera are largely attributable to the actions of a secreted hexameric AB5 enterotoxin (choleragen). The authors have independently solved and refined the three-dimensional structure of choleragen at 2.5 Å resolution The structure of the crystalline toxin closely resembles that described for the heat-labile enterotoxin from Escherichia coli (LT) with which it shares 80% sequence homol. In both cases, the wedge-shaped A subunit is loosely held high above the plane of the pentameric B subunits by the tethering A2 chain. The most striking difference between the two toxins occurs at the carboxyl terminus of the A2 chain. Whereas the last 14 residues of the A2 chain of LT threading through the central pore of the B5 assembly form an extended chain with a terminal loop, the A2 chain of choleragen remains a nearly continuous α-helix throughout its length. The four carboxyl-terminal residues of the A2 chain (KDEL sequence), disordered in the crystal structure of LT, are clearly visible in choleragen's electron-d. map. In the accompanying article the authors describe the three-dimensional structure of the isolated B pentamer of cholera toxin (choleragenoid). Comparison of the crystalline coordinates of choleragen, choleragenoid, and LT provides a solid three-dimensional foundation for further exptl. investigation. These structures, along with those of related toxins from Shigella dysenteria and Bordetella pertussis, offer a first step towards the rational design of new vaccines and anti-microbial agents.

L2 ANSWER 17 OF 30 BIOSIS COPYRIGHT (c) 2005 The Thomson Corporation on STN
AN 1995:290677 BIOSIS
DN PREV199598304977
TI Pertussis Toxin Binding To Specific Glycolipids: A Model for Macrophage Binding?.
AU Hutson, Christopher L.; **Spangler, Brenda D.**
CS Northern Illinois University, DeKalb, IL 60115, USA
SO Abstracts of the General Meeting of the American Society for Microbiology, (1995) Vol. 95, No. 0, pp. 237.
Meeting Info.: 95th General Meeting of the American Society for Microbiology. Washington, D.C., USA. May 21-25, 1995.
ISSN: 1060-2011.
DT Conference; (Meeting)
Conference; Abstract; (Meeting Abstract)
LA English
ED Entered STN: 5 Jul 1995
Last Updated on STN: 5 Jul 1995

L2 ANSWER 18 OF 30 CAPLUS COPYRIGHT 2005 ACS on STN

AN 1995:924493 CAPLUS
TI Interaction of pertussis toxin with glycolipid receptors in the presence of inhibitory peptides.
AU Johnson, Rhonda L.; **Spangler, Brenda D.**
CS Department Chemistry, Northern Illinois University, DeKalb, IL, 60115, USA
SO Book of Abstracts, 210th ACS National Meeting, Chicago, IL, August 20-24 (1995), Issue Pt. 2, MEDI-230 Publisher: American Chemical Society, Washington, D. C.
CODEN: 61XGAC
DT Conference; Meeting Abstract
LA English
AB The binding oligomer of pertussis toxin from Bordetella pertussis functions as an adhesion and T-cell mitogen, recognizing and binding to respiratory cilia, lymphocytes and a variety of cell types. Peptides homologous to sequences on the S2 and S3 subunits of the binding oligomer were synthesized and used as competitive inhibitors of PT binding to glycolipids in an effort to identify sequences on the toxin protein that recognize particular receptors. In the present study, results using monoclonal antibodies that recognize each subunit of the toxin suggest that the peptides may bind glycolipids and cause the toxin mol. to modify its orientation, conformation, or binding site utilization.

L2 ANSWER 19 OF 30 BIOSIS COPYRIGHT (c) 2005 The Thomson Corporation on STN
AN 1995:422678 BIOSIS
DN PREV199598436978
TI Interaction of pertussis toxin with glycolipid receptors in the presence of inhibitory peptides.
AU Johnson, Rhonda L.; **Spangler, Brenda D.**
CS Dep. Chem., Northern Illinois Univ., DeKalb, IL 60115, USA
SO Abstracts of Papers American Chemical Society, (1995) Vol. 210, No. 1-2, pp. MEDI 230.
Meeting Info.: 210th American Chemical Society National Meeting. Chicago, Illinois, USA. August 20-24, 1995.
CODEN: ACSRAL. ISSN: 0065-7727.
DT Conference; (Meeting)
Conference; Abstract; (Meeting Abstract)
LA English
ED Entered STN: 3 Oct 1995
Last Updated on STN: 3 Oct 1995

L2 ANSWER 20 OF 30 CAPLUS COPYRIGHT 2005 ACS on STN DUPLICATE 3
AN 1993:553735 CAPLUS
DN 119:153735
TI Hydrophobic binding of pertussis toxin is enhanced by oligosaccharide receptors
AU **Spangler, Brenda D.**; Heerze, Louis D.; Clark, Clifford G.; Armstrong, Glen D.
CS Biol. Med. Res. Div., Argonne Natl. Lab., Argonne, IL, 60439, USA
SO Archives of Biochemistry and Biophysics (1993), 305(1), 153-8
CODEN: ABBIA4; ISSN: 0003-9861
DT Journal
LA English
AB Pertussis toxin in an oligomeric A-B class toxin composed of an ADP-ribosyltransferase S1 (A) subunit and a B oligomer containing lectin-like binding domains. The carbohydrate binding specificity of the B oligomer is for sialooligosaccharide sequences expressed on target cell receptors and asparagine-linked glycans found in many serum glycoproteins. Pertussis toxin also has the ability to bind to the inert surfaces of culture tubes. The authors present data showing that pertussis toxin binding to polypropylene microcentrifuge tubes was enhanced in a time- and concentration-dependent manner by the addition of soluble glycoprotein or oligosaccharide receptor analogs. Evidence obtained using the hydrophilic and hydrophobic surfaces of Gel Bond electrophoresis casting film indicated that receptor-enhanced binding was likely due to hydrophobic interactions. Hydrophobic binding of the isolated B oligomer of pertussis toxin was enhanced only in the presence of high concns. of glycoproteins. Therefore, the S1 (A) subunit of pertussis holotoxin appears to play a

role in receptor-enhanced hydrophobic binding. Therefore, pertussis toxin binding to its receptors may expose or preferentially orient hydrophobic residues that may contribute to the functional association of the toxin with host cell plasma membranes and delivery of the S1 subunit to its intracellular target.

L2 ANSWER 21 OF 30 CAPLUS COPYRIGHT 2005 ACS on STN DUPLICATE 4
AN 1993:74838 CAPLUS
DN 118:74838
TI Structure and function of cholera toxin and the related Escherichia coli heat-labile enterotoxin
AU **Spangler, Brenda D.**
CS Biol. Med. Res. Div., Argonne Natl. Lab., Argonne, IL, 60439, USA
SO Microbiological Reviews (1992), 56(4), 622-47
CODEN: MBRED3; ISSN: 0146-0749
DT Journal; General Review
LA English
AB A review with 297 refs. Recent information about cholera toxin (CT) and heat-labile toxin (LT) structure and phys. properties, interactions with membranes, receptor binding, translocation, enzymol., and immunol. is presented. It also discusses effects of CT on cells and substrates not involved in the disease process. The author's purpose is to describe the phys. and biochem. properties of CT and LT and relate those properties to mol. structure.

L2 ANSWER 22 OF 30 CAPLUS COPYRIGHT 2005 ACS on STN
AN 1993:207717 CAPLUS
DN 118:207717
TI Importance of protein and DNA phosphate ester backbone flexibility in protein-DNA recognition
AU Wisniowski, Paul; Karslake, Christine; Piotto, Martial; **Spangler, Brenda**; Moulin, Anne Claire; Nikonowicz, Edward P.; Kaluarachchi, Kumaralal; Gorenstein, David G.
CS Dep. Chem., Purdue Univ., West Lafayette, IN, 47907, USA
SO Struct. Funct., Proc. Conversation Discip. Biomol. Stereodyn., 7th (1992), Meeting Date 1991, Volume 2, 17-54. Editor(s): Sarma, Ramaswamy H.; Sarma, Mukti H. Publisher: Adenine Press, Schenectady, N. Y.
CODEN: 58HXAL
DT Conference
LA English
AB The NMR spectra of various 14-base-pair (bp) lac operators free and bound to both wild-type and mutant lac repressor headpiece proteins were analyzed to provide information on the backbone conformation in the complexes A Tyr-7 → Ile (Y7I) mutant of the lac repressor protein was constructed by site-specific oligonucleotide directed mutagenesis. The 1H NMR spectrum of the N-terminal 56-residue headpiece fragment of the mutant lac repressor protein was assigned by sequence-specific 2-dimensional (2D) NMR methods. The chemical shifts of the mutant repressor headpiece were nearly identical to those of the wild-type headpiece with the exception of those residues adjacent to the mutation site. The overall binding to a 322 bp lac operator fragment was reduced by only 3-fold compared to the wild-type protein. However the recognition helix was partially disrupted as evidenced by the intensities of the NH-NH crosspeaks in the 2D NOESY spectrum, suggesting that the operator may induce proper folding and stabilization of the DNA recognition helix. The changes in the 31P chemical shifts upon addition of the wild-type and mutant headpieces plateaued at a ratio of 2 headpiece fragments per sym. 14-mer operators. The 31P NMR spectrum of the wild-type sym. operator, d(TGTGAGCGCTCACA)2, bound to the N-terminal 56-residue headpiece fragment of the Y7I mutant repressor was nearly identical to the spectrum of the same operator bound to the wild-type repressor headpiece. In contrast, the 31P NMR spectrum of the mutant operator, d(TATGAGCGCTCATA)2, wild-type headpiece complex was significantly perturbed relative to the wild-type repressor-operator complex. The 31P chemical shifts of the phosphates of a 2nd mutant operator, d(TGTGTGCGCACACA)2, did not significantly change upon complexation with the wild-type headpiece. The 31P NMR results provided further evidence for predominant recognition of the 5'-strand of the 5'-TGTGA/3'-ACACT binding site in a 2:1 protein to headpiece complex. It

was proposed that specific, tight-binding operator-protein complexes retain the inherent phosphate ester conformational flexibility of the operator itself, whereas the phosphate esters are conformationally restricted in the weak-binding operator-protein complexes. This retention of backbone torsional freedom in strongly bound complexes is entropically favorable and provides a new mechanism for protein discrimination of different operator binding sites. It demonstrates the potential importance of phosphate geometry and flexibility on protein recognition and binding.

L2 ANSWER 23 OF 30 CAPLUS COPYRIGHT 2005 ACS on STN
AN 1991:201993 CAPLUS
DN 114:201993
TI Construction, DNA binding, two-dimensional nuclear magnetic resonance spectrum, and structure of a mutant lac repressor headpiece
AU Karslake, Christine; Wisniowski, Paul; **Spangler, Brenda D.**; Moulin, Anne Claire; Wang, Pei Ling; Gorenstein, David G.
CS Dep. Chem., Purdue Univ., West Lafayette, IN, 47907, USA
SO Journal of the American Chemical Society (1991), 113(10), 4003-5
CODEN: JACSAT; ISSN: 0002-7863
DT Journal
LA English
AB The secondary structure of a 56-residue lac repressor mutant headpiece was studied by 2-dimensional NMR. The tyrosine-7 to isoleucine (Y7I) mutation was designed to test the importance of tyrosine-7-tyrosine-17 stacking for stabilization of the protein and DNA recognition. The mutation significantly disrupted secondary conformation of the protein, although tertiary structure was largely unaffected. A lesser effect on DNA recognition was noted.

L2 ANSWER 24 OF 30 CAPLUS COPYRIGHT 2005 ACS on STN
AN 1991:512349 CAPLUS
DN 115:112349
TI Binding to native proteins by antipeptide monoclonal antibodies
AU **Spangler, Brenda D.**
CS Biol. Med. Res. Div., Argonne Natl. Lab., Argonne, IL, 60439-4833, USA
SO Journal of Immunology (1991), 146(5), 1591-5
CODEN: JOIMA3; ISSN: 0022-1767
DT Journal
LA English
AB Monoclonal antibodies (mAb) raised against synthetic peptides derived from cholera toxin, myohemerythrin, and sickle Hb were analyzed by both solid-phase and solution-phase methods. Antipeptide mAb against cholera toxin (mAb TE32 and TE33), against myohemerythrin (mAb B13I2, B13C2, and B13F2), and against sickle Hb (mAb HuS-1 and HuS-2), had been previously described and were apparently capable of binding both peptide and native antigen (Ag). In this study, all were found to bind whole protein when tested against immobilized Ag in a standard solid-phase assay (ELISA), yet none of the antibodies recognized the Ag in its true native form, failing to bind when tested in several solution-phase assay systems, including size exclusion HPLC. This discrepancy may be the result of modifications of the epitope created by interaction and possible denaturation of the protein on the solid-phase matrix. As a consequence, binding of these antibodies to peptides, either immobilized or in solution, or to immobilized protein, cannot be used to infer that the peptide has assumed a conformation that corresponds to that of the cognate sequence in the native protein. A re-evaluation of binding data that relates antipeptide mAb to native structural characteristics may be necessary.

L2 ANSWER 25 OF 30 CAPLUS COPYRIGHT 2005 ACS on STN
AN 1991:225139 CAPLUS
DN 114:225139
TI Isolation of isoelectrically pure cholera toxin for crystallization
AU **Spangler, Brenda D.**; Westbrook, Edwin M.
CS Biol. Med. Res. Div., Argonne Natl. Lab., Argonne, IL, 60439-4833, USA
SO Journal of Crystal Growth (1991), 110(1-2), 220-7
CODEN: JCRGAE; ISSN: 0022-0248
DT Journal

LA English
AB The authors have determined that the failure of cholera toxin to crystallize well results from its isoelec. heterogeneity, which is probably due to a posttranslational process such as deamidation of its B subunit. Every sample of cholera toxin examined from com. or academic suppliers has been heterogeneous; heterogeneous cholera toxin does not crystallize satisfactorily. This problem was overcome by using ion-exchange fast protein liquid chromatog. (FPLC) to obtain an isoelec. homogeneous species of cholera toxin. Homogeneous cholera toxin crystallizes readily, forming single, nonmosaic crystals suitable for x-ray diffraction studies. For this process, protein was applied to a MonoQ ion-exchange column, then eluted with an isocratic low salt buffer followed by a linear salt gradient (0-100 mM NaCl). Column fractions were analyzed on isoelec. focusing gels, and those fractions containing the desired homogeneous species were pooled and concentrated Crystals formed within 24 to 48 h in a MOPS/PEG buffer, which made use of slow isoelec. precipitation to induce crystallization

L2 ANSWER 26 OF 30 CAPLUS COPYRIGHT 2005 ACS on STN
AN 1989:70830 CAPLUS
DN 110:70830
TI Crystallization of isoelectrically homogeneous cholera toxin
AU **Spangler, Brenda D.**; Westbrook, Edwin M.
CS Biol., Environ. Med. Res. Div., Argonne Natl. Lab., Argonne, IL, 60439, USA
SO Biochemistry (1989), 28(3), 1333-40
CODEN: BICHAW; ISSN: 0006-2960
DT Journal
LA English
AB Failure of cholera toxin to crystallize well was due to its heterogeneity. This problem was overcome by isolating a single isoelec. variant of this oligomeric protein (1 A subunit and 5 B subunits). Cholera toxin purified by this procedure readily forms large single crystals. Data from native crystals of cholera toxin was recorded to 3.0-Å resolution with electronic area detectors. With the data, the orientation of a 5-fold symmetry axis within the crystals, perpendicular to the screw dyad of the crystal was found.

L2 ANSWER 27 OF 30 CAPLUS COPYRIGHT 2005 ACS on STN
AN 1989:544462 CAPLUS
DN 111:144462
TI Structure of crystal violet tetraphenylborate
AU **Spangler, Brenda D.**; Vanysek, Petr; Hernandez, Irma C.; Rogers, Robin D.
CS Dep. Chem., Northern Illinois Univ., DeKalb, IL, 60115, USA
SO Journal of Crystallographic and Spectroscopic Research (1989), 19(3), 589-96
CODEN: JCREDB; ISSN: 0277-8068
DT Journal
LA English
AB Crystal violet tetraphenylborate is orthorhombic, space group Pn21, with a 9.497(6), b 16.474(5), and c 25.894(9) Å; d. (calculated) = 1.13 for Z = 4. Final R = 0.045 (Rw = 0.044) for 1842 reflections. Atomic coordinates, bond angles and distances are given. The compound conducts poorly in either the crystalline state or as a pressed pellet although it serves well as a solution electrolyte.

L2 ANSWER 28 OF 30 CAPLUS COPYRIGHT 2005 ACS on STN
AN 1986:567916 CAPLUS
DN 105:167916
TI Cytochrome c peroxidase compound I: formation of covalent protein crosslinks during the endogenous reduction of the active site
AU **Spangler, Brenda D.**; Erman, James E.
CS Dep. Chem., Northern Illinois Univ., DeKalb, IL, 60115, USA
SO Biochimica et Biophysica Acta (1986), 872(1-2), 155-7
CODEN: BBACAQ; ISSN: 0006-3002
DT Journal
LA English
AB Cytochrome c peroxidase (EC 1.11.1.5) was oxidized by H2O2 in the absence

of an exogenous electron donor. Higher-mol.-weight species were observed in the decay products at pH 4.5. Monomer and dimer were separated by gel filtration and purified by anion-exchange chromatog. Peptide mapping of tryptic digests of the dimer indicated a tyrosine crosslink localized between residues 32 and 48 of the native enzyme.

L2 ANSWER 29 OF 30 CAPLUS COPYRIGHT 2005 ACS on STN
AN 1985:58317 CAPLUS
DN 102:58317
TI Oxidation of cytochrome c peroxidase by hydrogen peroxide: characterization of endogenous decay products
AU **Spangler, Brenda Dolgin**
CS North. Illinois Univ., DeKalb, IL, USA
SO (1984) 157 pp. Avail.: Univ. Microfilms Int., Order No. DA8421288
From: Diss. Abstr. Int. B 1984, 45(6), 1762-3
DT Dissertation
LA English
AB Unavailable

L2 ANSWER 30 OF 30 CAPLUS COPYRIGHT 2005 ACS on STN
AN 1973:452605 CAPLUS
DN 79:52605
TI Kinetics of thermal electrocyclic ring closure. Alkyl-1,3,5-hexatrienes
AU Spangler, Charles W.; Jondahl, Thor P.; **Spangler, Brenda**
CS Dep. Chem., North. Illinois Univ., DeKalb, IL, USA
SO Journal of Organic Chemistry (1973), 38(14), 2478-84
CODEN: JOCEAH; ISSN: 0022-3263
DT Journal
LA English
AB Kinetic studies of thermal electrocyclization of a series of 1- and 3-R-1,3,5-hexatrienes (R = Me, Et, tert-Bu) yielded the following relative rates: 3-tert-Bu > 3-Et, 3-Me > 1-Et > 1-Me, H. The activation enthalpies of the 3-alkyl series were, in general, 3 kcal/mole < either the 1-alkyl derivs. of the parent hydrocarbon. These results can be interpreted in terms of the donating ability of alkyl groups, steric retardation at the reaction sites, and differences in ground-state energies and conformation.

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=> e spangler charles/au
E1            2     SPANGLER CELENE M/AU
E2            3     SPANGLER CHAD C/AU
E3            9 --> SPANGLER CHARLES/AU
E4            3     SPANGLER CHARLES E/AU
E5            1     SPANGLER CHARLES EDGAR/AU
E6          165     SPANGLER CHARLES W/AU
E7            1     SPANGLER CHARLES WILLIAM/AU
E8            1     SPANGLER CHRISTOPHER/AU
E9            1     SPANGLER CHRISTOPHER A/AU
E10           4     SPANGLER CHRISTOPHER J/AU
E11           2     SPANGLER CLAYTON W/AU
E12           1     SPANGLER CLINTON/AU

=> s e6-e7 and dendrimer?
L3           29 ("SPANGLER CHARLES W"/AU OR "SPANGLER CHARLES WILLIAM"/AU) AND
                DENDRIMER?

=> dup rem l3
PROCESSING COMPLETED FOR L3
L4            29 DUP REM L3 (0 DUPLICATES REMOVED)

=> d bib ab 1-
YOU HAVE REQUESTED DATA FROM 29 ANSWERS - CONTINUE? Y/(N):y
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L4 ANSWER 1 OF 29 CAPLUS COPYRIGHT 2005 ACS on STN
AN 2005:158490 CAPLUS
DN 142:235999
TI Biosensors utilizing **dendrimer**-immobilized ligands and their use thereof

IN Spangler, Brenda D.; **Spangler, Charles W.**
PA Montana State University, USA
SO PCT Int. Appl., 45 pp.
CODEN: PIXXD2
DT Patent
LA English
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI WO 2005016115	A2	20050224	WO 2004-US1961	20040123

W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VC, VN, YU, ZA, ZM, ZW
RW: BW, GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG

PRAI US 2003-442270P P 20030123

AB The present invention is directed to methods and compns. useful as biosensors that specifically interact with various pathogens and other target analytes. The biosensor itself comprises functionalized dendritic tethers derivatized for attachment to a variety of surfaces as self-assembled monolayers (SAMs) as well as attached binding moieties (sometimes referred to as capture binding ligands). Accordingly, the present invention provides compns. comprising supports comprising surfaces to which the binding moieties (e.g. antibodies) are attached for the detection of target analytes (e.g. pathogens) as well as methods and compns. relating to the attachment of such binding moieties.

L4 ANSWER 2 OF 29 USPATFULL on STN
AN 2004:313857 USPATFULL
TI Multifunctional photodynamic agents for treating of disease
IN **Spangler, Charles W.**, Livingston, MT, UNITED STATES
Rebane, Aleksander, Bozeman, MT, UNITED STATES
PA MPA Technologies, Inc. (U.S. corporation)
PI US 2004247527 A1 20041209
AI US 2004-805683 A1 20040310 (10)
PRAI US 2003-453618P 20030310 (60)
DT Utility
FS APPLICATION
LREP Robin M. Silva, Esq., Dorsey & Whitney LLP, Intellectual Property Department, Four Embarcadero Center, Suite 3400, San Francisco, CA, 94111-4187
CLMN Number of Claims: 7
ECL Exemplary Claim: 1
DRWN 4 Drawing Page(s)
LN.CNT 1729
CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB The present invention is directed to methods and compositions comprising multifunctional (usually bi- or tri-functional) agents that incorporate a targeting moiety, a photo dynamic therapy (PDT) moiety (either one or two photon), and an optional imaging agent (such as a chromophore, contrast agent, etc.).

L4 ANSWER 3 OF 29 CAPLUS COPYRIGHT 2005 ACS on STN
AN 2003:524296 CAPLUS
DN 139:231203
TI Strong Cooperative Enhancement of Two-Photon Absorption in **Dendrimers**
AU Drobizhev, Mikhail; Karotki, Aliaksandr; Dzenis, Yuliya; Rebane, Aleksander; Suo, Zhiyong; **Spangler, Charles W.**
CS Department of Physics, Montana State University, Bozeman, MT, 59717, USA
SO Journal of Physical Chemistry B (2003), 107(31), 7540-7543
CODEN: JPCBFK; ISSN: 1520-6106
PB American Chemical Society

DT Journal
LA English
AB We present, for the first time, unambiguous spectroscopic evidence of strong cooperative enhancement of two-photon absorption (TPA) in a series of dendritic macromols. The maximum TPA cross section increases in proportion to N2, where N = 2, 4, 6 is the number of constituent identical chromophore units. We show that the enhancement is facilitated by the quasi-planar structure, which allows direct interbranch conjugation throughout the mol.
RE.CNT 35 THERE ARE 35 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L4 ANSWER 4 OF 29 CAPLUS COPYRIGHT 2005 ACS on STN
AN 2003:666901 CAPLUS
DN 140:32871
TI New **dendrimers** based on PPV-oligomer and triphenylamine units with strong cooperative enhancement of two-photon absorption
AU Suo, Zhiyong; **Spangler, Charles W.**; Drobizhev, Mikhail; Karotki, Aliaksandr; Dzenis, Yuliya; Rebane, Aleksander
CS Department of Chemistry and Biochemistry, Montana State University, Bozeman, MT, 59717, USA
SO Polymeric Materials Science and Engineering (2003), 89, 704-705
CODEN: PMSEDG; ISSN: 0743-0515
PB American Chemical Society
DT Journal; (computer optical disk)
LA English
AB The 3-arm and 4-arm **dendrimers** were synthesized based on PPV oligomer and triphenylamine repeating units. Strong cooperative enhancement of 2-photon absorption cross section was observed in these **dendrimers**. One of the **dendrimers** showed one of the largest intrinsic 2-photon absorption cross section for a single medium-size mol.
RE.CNT 41 THERE ARE 41 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L4 ANSWER 5 OF 29 CAPLUS COPYRIGHT 2005 ACS on STN
AN 2003:636804 CAPLUS
TI New **dendrimers** based on PPV-oligomer and triphenylamine units with strong cooperative enhancement of two-photon absorption
AU Suo, Z. Y.; **Spangler, Charles W.**; Drobizhev, Mikhail; Karotki, Aliaksandr; Dzenis, Yuliya; Rebane, Aleksander
CS Department of Chemistry and Biochemistry, Montana State University, Bozeman, MT, 59717, USA
SO Abstracts of Papers, 226th ACS National Meeting, New York, NY, United States, September 7-11, 2003 (2003), PMSE-422 Publisher: American Chemical Society, Washington, D. C.
CODEN: 69EKY9
DT Conference; Meeting Abstract
LA English
AB Two G-0 **dendrimers** based on triphenylamine and poly(phenylenevinyl) (PPV)-oligomer repeat units were synthesized and showed excellent two-photon absorption in near IR region. The two-photon absorption cross-section of these **dendrimers** increases faster than the extinction coefficient does, which implies strong cooperative enhancement of two-photon absorption in these mols.

L4 ANSWER 6 OF 29 CAPLUS COPYRIGHT 2005 ACS on STN
AN 2003:891022 CAPLUS
DN 141:196944
TI Strong two-photon absorption in new porphyrins with asymmetrical meso-substitution
AU Drobizhev, Mikhail; Karotki, Aliaksandr; Kruk, Mikalai; Dzenis, Yuliya; Rebane, Aleksander; Meng, Fanqing; Nickel, Eric; **Spangler, Charles W.**
CS Department of Physics, Montana State University, Bozeman, MT, 59717, USA
SO Proceedings of SPIE-The International Society for Optical Engineering (2003), 5211(Nonlinear Optical Transmission and Multiphoton Processes in Organics), 63-74

CODEN: PSISDG; ISSN: 0277-786X
PB SPIE-The International Society for Optical Engineering
DT Journal
LA English
AB Porphyrins and related mols. with strong two-photon absorption (TPA) are extremely called for because of several emerging applications, including 3-dimensional optical memory, high-resolution fluorescence microscopy and photodynamic therapy. An asym. meso-substitution of porphyrin macrocycle with electron-donating diphenylamino-stilbene or bis-(diphenylamino)-stilbene groups results in a drastic enhancement of intrinsic TPA cross section in the near-IR region. The cross section value amts. to 500-900 GM depending on substituent group and link structure, which is .apprx.102 times the corresponding value for the unsubstituted parent mol. Compared to sym. porphyrins, the TPA spectra of this series follow qual. the corresponding 1-photon spectra. Therefore, the authors describe the observed TPA spectra and absolute cross section values by taking into account the change of permanent dipole moment upon excitation. A new zeroth-generation **dendrimer**, consisting of a porphyrin core, sym. tertakis-meso-substituted with strong TPA dendrons, reveals 7 times increase of the cross section (740 vs. 110 GM) as compared to its mono-meso-substituted analog. The authors also demonstrated an efficient singlet O generation upon two-photon excitation of these new mols., which makes them particularly attractive for photodynamic therapy.
RE.CNT 12 THERE ARE 12 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L4 ANSWER 7 OF 29 CAPLUS COPYRIGHT 2005 ACS on STN
AN 2003:573511 CAPLUS
TI Bioactive dendritic SAMS for detection of pathogens
AU **Spangler, Charles W.**; Tarter, E. Scott; Hyman, Deborah A.
CS Montana State University, Bozeman, MT, USA
SO Abstracts, 58th Northwest Regional Meeting of the American Chemical Society, Bozeman, MT, United States, June 12-14 (2003), 41 Publisher: American Chemical Society, Washington, D. C.
CODEN: 69EBEU
DT Conference; Meeting Abstract
LA English
AB Deaths from exposure to anthrax or other pathogens may be preventable for first responders to a terror attack and for those who may have been exposed to a pathogenic agent, depending on quick response times for treatment. Therefore, rapid, portable, simple and specific biosensors must be designed to identify the exact nature of the pathogen. For this purpose, we have developed a new approach to the design of biosensor surfaces based on multivalent **dendrimers** capable of immobilizing antibodies for detection of a variety of bacterial protein toxins, the specific and rapidly expressed virulence factors directly responsible for disease and death. Recombinant, monoclonal or polyclonal antibodies against selected toxins are derivatized with a unique functional group. A dendritic tether can be assembled on a gold surface and the derivatized antibody attached in a short time period, providing a rapid, highly selective and specific chip suitable for pathogen detection in a portable surface plasmon resonance sensor. We have tested this self-assembled bioactive surface to detect anthrax PA, the requisite binding subunit of anthrax toxin, using anti-anthrax PA antibody immobilized on a gold-coated slide in a portable version of a surface plasmon resonance instrument. Potential applications for these dendritic tethers include use with quartz crystal microbalance sensors and surface acoustic wave devices and, with custom modifications, bioactive surfaces for fiber optic and wave guide sensors, and for tip functionalization for atomic force microscopy. The dendritic tethers could also be adapted to solution-phase antibody-based fluorescence techniques such as protein or DNA microarrays.

L4 ANSWER 8 OF 29 CAPLUS COPYRIGHT 2005 ACS on STN
AN 2003:891019 CAPLUS
DN 141:207720
TI Cooperative enhancement of two- and three-photon absorption in **dendrimers** and their underlying coherent domain structure
AU Drobizhev, Mikhail; Karotki, Aliaksandr; Dzenis, Yuliya; Kruk, Mikalai;

Rebane, Aleksander; Suo, Zhiyong; **Spangler, Charles W.**
CS Department of Physics, Montana State University, Bozeman, MT, 59717, USA
SO Proceedings of SPIE-The International Society for Optical Engineering (2003), 5211(Nonlinear Optical Transmission and Multiphoton Processes in Organics), 38-47
CODEN: PSISDG; ISSN: 0277-786X
PB SPIE-The International Society for Optical Engineering
DT Journal
LA English
AB At present special attention is concentrated on increasing the efficiency of multi-photon absorption of organic systems because of new emerging applications based on this effect. In the expts., strong 2-photon absorbing chromophore, 4,4'-bis(diphenylamino)stilbene (BDPAS), is used to design new **dendrimer** mols., in such a way that the branching center allows for π-electronic conjugation between branches. Here presented, for the first time, is unambiguous spectroscopic evidence of strong cooperative enhancement of 2-photon and 3-photon absorption in these dendritic macromols. Maximum 2-photon cross section increases in proportion to N2, where N = 2, 4, 6 is the number of constituent identical chromophore units in the parent BDPAS and lowest, G-0 generation **dendrimer**. Almost the same scaling law is observed for 3-photon absorption. For higher generations, G-1 and G-2, comprising N = 14 and 30 chromophores, resp., the cooperativity in multiphoton response starts to saturate Three-photon absorption provides important complementary information, which is used for evaluation of the size of domains where chromophores are coherently coupled.
RE.CNT 28 THERE ARE 28 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L4 ANSWER 9 OF 29 CAPLUS COPYRIGHT 2005 ACS on STN
AN 2003:178726 CAPLUS
TI Multifunctional dendritic tethers for detection of bioterror pathogens by surface plasmon resonance
AU Spangler, Brenda D.; Hyman, Deborah A.; Tarter, E. Scott; **Spangler, Charles W.**
CS Department of Chemistry and Biochemistry, Montana State University, Bozeman, MT, 59717, USA
SO Abstracts of Papers, 225th ACS National Meeting, New Orleans, LA, United States, March 23-27, 2003 (2003), ANYL-017 Publisher: American Chemical Society, Washington, D. C.
CODEN: 69DSA4
DT Conference; Meeting Abstract
LA English
AB The lack of rapid detection protocols for bioterrorism agents, particularly at the point of attack, was clearly demonstrated during the recent rash of anthrax attacks and hoaxes in the Fall of 2001. Deaths from exposure to anthrax or other pathogens may be preventable for first responders if the presence and identity of the pathogen can be quickly determined We have developed a new approach to the design of self-assembled monolayers (SAMs) based on multivalent **dendrimers** capable of immobilizing antibodies for detection of a variety of bacterial protein toxins, the specific and rapidly expressed virulence factors directly responsible for disease and death. Recombinant, monoclonal or polyclonal antibodies against the selected toxins are derivatized with a unique functional group. The dendritic tether can be assembled on a gold surface and the derivatized antibody attached in a short time period, providing a rapid, highly selective and specific chip suitable for pathogen detection in a portable surface plasmon resonance sensor.

L4 ANSWER 10 OF 29 USPATFULL on STN
AN 2001:236588 USPATFULL
TI Mode-locked laser infrared detection card and method
IN Rebane, Aleksander, Bozeman, MT, United States
Spangler, Charles W., Livingston, MT, United States
PI US 2001054696 A1 20011227
AI US 2001-834727 A1 20010416 (9)
PRAI US 2000-197674P 20000417 (60)
DT Utility

FS APPLICATION
LREP MORGAN, LEWIS & BOCKIUS, 1800 M STREET NW, WASHINGTON, DC, 20036-5869
CLMN Number of Claims: 35
ECL Exemplary Claim: 1
DRWN 5 Drawing Page(s)
LN.CNT 534
CAS INDEXING IS AVAILABLE FOR THIS PATENT.
AB An apparatus and method of detection and visualization of an infrared laser beam using an optically transparent or opaque solid medium doped with at least one active chromophore dye molecule to provide conversion of infrared radiation to visible light by means of two or three-photon absorption followed by emission of a visible photon is provided. A method of verifying mode-lock in mode-locked infrared laser sources and measuring the temporal and spatial shape of ultra short laser pulses having pulse durations between a few femtoseconds and hundreds of picoseconds is also provided.

L4 ANSWER 11 OF 29 CAPLUS COPYRIGHT 2005 ACS on STN
AN 2001:567122 CAPLUS
DN 135:324880
TI **Dendrimer** molecules with record large two-photon absorption cross section
AU Drobizhev, Mikhail; Karotki, Aliaksandr; Rebane, Aleksander; **Spangler, Charles W.**
CS Department of Physics, Montana State University, Bozeman, MT, 59717, USA
SO Optics Letters (2001), 26(14), 1081-1083
CODEN: OPLEDP; ISSN: 0146-9592
PB Optical Society of America
DT Journal
LA English
AB We report what is to our knowledge a record high value for an intrinsic two-photon absorption (TPA) cross section, σ2 = 11 + 10-47 cm4 s photon-1 mol.-1, measured with femtosecond pulses in a new **dendrimer** mol. comprising 29 repeat units of 4,4'-bis(diphenylamino)stilbene chromophore. We measure the dependence of TPA on excitation wavelength in three consecutive generations of the **dendrimer** and show that the maximum σ2 value increases faster than the total number of stilbene chromophores. This result indicates that it is possible to obtain even larger σ2 values in higher generations of this **dendrimer** family.
RE.CNT 18 THERE ARE 18 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L4 ANSWER 12 OF 29 CAPLUS COPYRIGHT 2005 ACS on STN
AN 2003:381422 CAPLUS
DN 138:338065
TI Design and synthesis of new electron-acceptor chromophores for incorporation into dendrons and **dendrimers** for enhanced reverse saturable absorption
AU Tarter, Scott; Li, Hu; **Spangler, Charles W.**
CS Dep. of Chem. & Biochem., Optical Technol. Cent., Montana State Univ., Bozeman, MT, 59717, USA
SO Polymeric Materials Science and Engineering (2001), 84, 719-720
CODEN: PMSEDG; ISSN: 0743-0515
PB American Chemical Society
DT Journal
LA English
OS CASREACT 138:338065
AB Several new electron-acceptor chromophores have been synthesized based on 3,4-ethylenedioxythiophene (EDOT) moieties. These acceptors have been substituted with tricyanovinyl groups, which shift their absorption spectra into the desired 500-800 rim region of the visible. These materials are being studied in solution as the chromophore, and as dendrons formed from 3,5-dihydroxybenzyl alc., and **dendrimers** formed from. dendron coupling to bisphenol A. These chromophores are currently being derivatized for covalent attachment to a variety of **dendrimer**-type structures.
RE.CNT 5 THERE ARE 5 CITED REFERENCES AVAILABLE FOR THIS RECORD

ALL CITATIONS AVAILABLE IN THE RE FORMAT

L4 ANSWER 13 OF 29 CAPLUS COPYRIGHT 2005 ACS on STN
AN 2003:381421 CAPLUS
DN 138:337752
TI **Dendrimers** based on bis-(diphenylamino)stilbene repeat units: effect of anthracenyl end-caps
AU Holmberg, Shawndra E.; **Spangler, Charles W.**
CS Dep. of Chem. and Biochem., Optical Technol. Cent., Montana State Univ., Bozeman, MT, 59717, USA
SO Polymeric Materials Science and Engineering (2001), 84, 717-718
CODEN: PMSEDG; ISSN: 0743-0515
PB American Chemical Society
DT Journal
LA English
OS CASREACT 138:337752
AB We have described a methodol. for the preparation of new **dendrimers** that have 3- or 4-arm structural motifs. While previous **dendrimers** in this series were end-capped with diphenylaminophenyl groups, we have now prepared a new 3-arm. **dendrimer** end-capped with 9-anthracenyl groups. Oxidative doping of this new G-O **dendrimer** shows that either polaronic radical cation or a bipolaronic dication can be obtained. This is the first **dendrimer** in the series for which either charge state can be obtained readily, which has implications for the possible use of these new materials in optical limiting devices. We are currently synthesizing the 4-arm **dendrimer** with anthracenyl end-caps to see if this observation of ease of charge state formation is general.
RE.CNT 8 THERE ARE 8 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L4 ANSWER 14 OF 29 CAPLUS COPYRIGHT 2005 ACS on STN
AN 2001:204097 CAPLUS
TI Design and synthesis of new electron-acceptor chromophores for incorporation into dendrons and **dendrimers** for enhanced reverse saturable absorption
AU Tarter, Scott; Li, Hu; **Spangler, Charles W.**
CS Department of Chemistry & Biochemistry, Montana State University, Bozeman, MT, 59717, USA
SO Abstracts of Papers, 221st ACS National Meeting, San Diego, CA, United States, April 1-5, 2001 (2001) PMSE-394
CODEN: 69FZD4
PB American Chemical Society
DT Journal; Meeting Abstract
LA English
AB Bis-(diphenylamino)diphenylpolyenes and bis-(alkylthio)-dithienylpolyenes have been shown to form exceptionally stable, highly absorbing bipolaronic dications in solution upon oxidative doping. Replacement of one diphenylamino group substituent with a N-(hydroxyethyl),N-Et moiety yields a polyene series that also forms stable bipolarons. Both chromophore series can be easily attached to 3,5-dihydroxybenzyl alc. to form intermediary dendrons capable of attachment to a variety of core mols. to yield functionalized **dendrimers**. We would now like to present a complementary approach to dendrons and **dendrimers** containing electron-accepting moieties as well as the polyene e-donors. Such D,A substituted dendrons and **dendrimers** show dramatic enhancement of photo-induced electron transfer which makes them attractive candidates for a variety of photonic applications. We have focused on acceptor structures that absorb light in the 500-600 nm region so that they can be optically pumped with a frequency-doubled Nd-YAG laser (532 nm) to induce the desired e-transfer.

L4 ANSWER 15 OF 29 CAPLUS COPYRIGHT 2005 ACS on STN
AN 2001:204096 CAPLUS
TI **Dendrimers** based on bis-(diphenylamino)stilbene repeat units: Effect of anthracenyl end-caps
AU Holmberg, Shawndra E.; **Spangler, Charles W.**
CS Department of Chemistry & Biochemistry, Montana State University, Bozeman,

MT, 59717, USA
SO Abstracts of Papers, 221st ACS National Meeting, San Diego, CA, United States, April 1-5, 2001 (2001) PMSE-393
CODEN: 69FZD4
PB American Chemical Society
DT Journal; Meeting Abstract
LA English
AB We have previously shown that **dendrimers** based on bis-(diphenylamino)diphenylpolyene repeat units can be readily synthesized in either 3-arm or 4-arm motifs. The G-0 model **dendrimers** for these series have been shown to have exceptionally large two-photon cross-sections for nanosecond laser pulses, and also display efficient photogeneration of transient polaronic charge states in the presence of various electron acceptors under intense laser fluence. These materials may thus be considered as bimechanistic optical limiters in the ns time domain. We would now like to present methodol. by which these materials can be made more efficiently, and how the **dendrimers** can be structurally and photonically modified by using anthracenyl end-caps. Oxidative doping of a model anthracenyl end-capped 3-arm **dendrimer**, derived from triphenylamine, can be controlled so that either a polaronic radical-cation or a bipolaronic dication can be obtained. Both charge states are more highly absorbing and broad-band compared to those obtained for corresponding **dendrimers** end-capped with diphenylamino groups, and thus may be better candidates as optical limiting materials than previously synthesized dendritic materials.

L4 ANSWER 16 OF 29 CAPLUS COPYRIGHT 2005 ACS on STN
AN 2003:381225 CAPLUS
DN 138:346197
TI Design and synthesis of new dendritic materials for photonics applications
AU **Spangler, Charles W.**; Elandaloussi, El Hadj; Reeves, Benjamin; Ozer, Berrak; Ashworth, Kimba
CS Dep. of Chem. and Biochem., Optical Technol. Cent., Montana State Univ., Bozeman, MT, 59717, USA
SO Polymeric Materials Science and Engineering (2001), 84, 226-227
CODEN: PMSEDG; ISSN: 0743-0515
PB American Chemical Society
DT Journal
LA English
AB **Dendrimers** were designed so that the photonic-active chromophores were essentially distributed on the **dendrimer** surfaces, approached via convergent schemes involving chromophore attachment to reactive dendrons, followed by the coupling of the dendrons to various core mols. A divergent strategy was followed to build up **dendrimer** structures based on a chromophore repeat unit. Both types had excellent photonic properties for such applications as reverse saturable absorption optical limiting, and ones requiring very large 2-photon cross section.
RE.CNT 7 THERE ARE 7 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L4 ANSWER 17 OF 29 CAPLUS COPYRIGHT 2005 ACS on STN
AN 2003:246163 CAPLUS
DN 139:27862
TI New two-photon absorbing organic molecules and macromolecules for photonic applications
AU Drobizhev, Mikhail; Rebane, Aleksander; Karotki, Aliaksandr; **Spangler, Charles W.**
CS Department of Physics, Montana State University, Bozeman, MT, 59717, USA
SO Recent Research Developments in Applied Physics (2001), 4, 197-222
CODEN: RDAPFM
PB Transworld Research Network
DT Journal; General Review
LA English
AB A review. The authors review the several original approaches aimed at using the effect of simultaneous 2-photon absorption in different potential applications. Specifically designed organic mols. and macromols. with enhanced intrinsic 2-photon absorption cross sections were

synthesized and characterized for some of these applications. In particular, the authors demonstrated a new **dendrimer** macromols. with a record high intrinsic 2-photon absorption cross-section, shown the possibility of permanent writing of spectral gratings as a result of interference in 2-photon absorption from femtosecond pulses, and designed a new porphyrin mol. capable to efficiently generate singlet O upon 2-photon excitation in tissue transparency window. Probably the results can should be used as practical guidelines in a wider set of cases, where increased ultrafast nonlinearity is crucial.

RE.CNT 84 THERE ARE 84 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L4 ANSWER 18 OF 29 CAPLUS COPYRIGHT 2005 ACS on STN
AN 2001:203826 CAPLUS
TI Design and synthesis of new dendritic materials for photonics applications
AU **Spangler, Charles W.**; Elandaloussi, El Hadj; Reeves, Benjamin; Ozer, Berrak; Ashworth, Kimba
CS Department of Chemistry & Biochemistry, Montana State University, Bozeman, MT, 59717, USA
SO Abstracts of Papers, 221st ACS National Meeting, San Diego, CA, United States, April 1-5, 2001 (2001) PMSE-128
CODEN: 69FZD4
PB American Chemical Society
DT Journal; Meeting Abstract
LA English
AB There has been considerable recent interest in the design, synthesis and spectroscopic characterization of new organic materials for a variety of photonics applications. Monodisperse dendritic macromols. have inherent advantages for applications in optical power limiting via reverse saturable absorption involving the photo-generation of highly absorbing transient charge states. We have designed series of new chromophores, dendrons and **dendrimers** for eye and sensor protection in the Visible region of the spectrum, utilizing convergent methodol. Most recently we have also synthesized **dendrimers** based on bis-(diphenylamino)stilbene and PPV-dimer repeat units via a divergent strategy. These new model **dendrimers** have extraordinarily large two-photon cross-sections for fs and ns laser pulses, which suggests a number of new applications that are not practical for mols. with smaller cross-sections. The efficacy of both convergent and divergent approaches to photonic-active **dendrimers** will be presented.

L4 ANSWER 19 OF 29 CAPLUS COPYRIGHT 2005 ACS on STN
AN 2001:354257 CAPLUS
DN 135:144115
TI New dendritic materials as potential OLED transport and emitter moieties
AU Padmaperuma, Asanga B.; Schmett, Greg; Fogarty, Daniel; Washton, Nancy; Nanayakkara, Sanjini; Sapochak, Linda; Ashworth, Kimba; Madrigal, Luis; Reeves, Benjamin; **Spangler, Charles W.**
CS Department of Chemistry, University of Nevada, Las Vegas, Las Vegas, NV, 89154-4003, USA
SO Materials Research Society Symposium Proceedings (2001), 621(Electron-Emissive Materials, Vacuum Microelectronics and Flat-Panel Displays), Q3.9.1-Q3.9.6
CODEN: MRSPDH; ISSN: 0272-9172
PB Materials Research Society
DT Journal
LA English
AB The absorbance, luminescence and thermal properties of oligomeric and model **dendrimers** based on bis(diphenylamino- and diphenylphosphino)-E-stilbene units were evaluated. Large energy shifts in absorbance and luminescence were observed for the oligomers when the N-heteroatoms were substituted with P. On the other hand, for the model **dendrimers** substitution of only the core N-heteroatom with P produced much smaller effects on the absorbance and emission properties. The model **dendrimer** STILD2 containing a P-heteroatom core exhibited superior thermal stability and higher EL efficiency than the corresponding material containing only N-heteroatoms when utilized as a hole-transporting layer.

RE.CNT 14 THERE ARE 14 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L4 ANSWER 20 OF 29 CAPLUS COPYRIGHT 2005 ACS on STN
AN 2000:208470 CAPLUS
DN 132:348057
TI Dendrons and **dendrimers** for optical power limiting
AU Ashworth, Kimba; Ozer, Berrak; Madrigal, Luis; Frost, Amy; Kuhl, Kristina; **Spangler, Charles W.**
CS Department of Chemistry and Biochemistry, Optical Technology Center, Montana State University, Bozeman, MT, 59717, USA
SO Polymer Preprints (American Chemical Society, Division of Polymer Chemistry) (2000), 41(1), 875-876
CODEN: ACPPAY; ISSN: 0032-3934
PB American Chemical Society, Division of Polymer Chemistry
DT Journal
LA English
AB Dendrons incorporating optical limiting chromophores can be formed from 3,5-dihydroxybenzyl alc. Model G-0 **dendrimers** can in turn be formed in good yield by coupling to a variety of core structures such as bisphenol A. In the G-0 **dendrimers**, all four chromophore moieties are oxidized to the bipolaron. Thus these new materials are suitable candidates for optical power limiting studies.
RE.CNT 7 THERE ARE 7 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L4 ANSWER 21 OF 29 CAPLUS COPYRIGHT 2005 ACS on STN
AN 2000:208423 CAPLUS
DN 132:335256
TI Design and synthesis of new photon-gathering **dendrimers**
AU **Spangler, Charles W.**; Elandaloussi, El Hadj; Reeves, Benjamin
CS Department of Chemistry and Biochemistry, Optical Technology Center, Montana State University, Bozeman, MT, 59717, USA
SO Polymer Preprints (American Chemical Society, Division of Polymer Chemistry) (2000), 41(1), 789-790
CODEN: ACPPAY; ISSN: 0032-3934
PB American Chemical Society, Division of Polymer Chemistry
DT Journal
LA English
AB There has been considerable recent interest in the design, synthesis and characterization of new organic chromophores and polymers with potentially large two-photon cross-sections for a variety of photonic applications. One particularly attractive system is based on poly[phenylene vinylene] (PPV) oligomers containing electron-donating substituents. We have recently synthesized several PPV dimer chromophores with bis-(diphenylamino) substituents attached to the terminal Ph rings, and have demonstrated that these materials have very large two-photon cross-sections for nanosecond laser pulses. We have now synthesized several G-0 **dendrimers** based on bis-(diphenylamino)-E-stilbene and PPV dimer repeat units. These model **dendrimers** have extraordinarily large two-photon cross-sections for ns laser pulses which we have ascribed to probable excited-state absorption from polaronic or bipolaronic transient charge state formation. The efficacy of this design approach will be presented, as well as future design paradigms for even greater TPA enhancement.
RE.CNT 5 THERE ARE 5 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L4 ANSWER 22 OF 29 CAPLUS COPYRIGHT 2005 ACS on STN
AN 2001:287181 CAPLUS
DN 135:53435
TI Photogeneration of highly absorbing transient charge states from model dendritic macromolecules based on Bis-(diphenylamino)diphenylpolyene repeat units
AU Hyfield, Amy; Sonnenberg, Wendi; Han, Yanong; Spangler, Lee H.; Elandaloussi, El Hadj; **Spangler, Charles W.**
CS Department of Chemistry and Biochemistry, Optical Technology Center, Montana State University, Bozeman, MT, 59717, USA
SO Journal of Nonlinear Optical Physics & Materials (2000), 9(4), 469-480

CODEN: JNOMFV; ISSN: 0218-8635
PB World Scientific Publishing Co. Pte. Ltd.
DT Journal
LA English
AB Bis-(diphenylamino)diphenylpolyenes form exceptionally stable, highly absorbing, bipolaronic charge states when oxidatively doped in solution, even at the stilbene level. These chromophores also display exceptionally large two-photon absorption cross-sections for ns laser pulses. 1,2-Bis-(diphenylamino)-E-stilbene moieties have now been incorporated into 3-arm and four-arm **dendrimer** structures as formal repeat units. These new G-0 model **dendrimers** also form exceptionally stable, highly-absorbing bipolaronic charge states when oxidized in solution As such these new materials are attractive candidates for various photonic applications which depend on the fast photogeneration of highly absorbing transient states. In the current study the authors have demonstrated that such states can indeed be photogenerated from the model **dendrimers** in solution in the presence of efficient electron acceptors, such as C60. In order to follow both the generation and decay of these excited state transient species, new spectroscopic techniques have been developed that have unique capabilities for examining transient state formation and subsequent dynamics.
RE.CNT 20 THERE ARE 20 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L4 ANSWER 23 OF 29 CAPLUS COPYRIGHT 2005 ACS on STN
AN 2000:334606 CAPLUS
TI Dendrons and **dendrimers** for optical power-limiting applications.
AU Ashworth, Kimba; Ozer, Berrak; Madrigal, Luis; Frost, Amy; Kuhl, Kristina; **Spangler, Charles W.**
CS Dept. of Chemistry and Biochemistry and Optical Technology Center, Montana State University, Bozeman, MT, 59717, USA
SO Book of Abstracts, 219th ACS National Meeting, San Francisco, CA, March 26-30, 2000 (2000), POLY-423 Publisher: American Chemical Society, Washington, D. C.
CODEN: 69CLAC
DT Conference; Meeting Abstract
LA English
AB Bis-(diphenylamino)diphenylpolyenes have been shown to form exceptionally stable, highly absorbing bipolaronic dications in solution and thin film. Replacement of one diphenylamino substituent with a N-(hydroxyethyl),N-ethylamino moiety yields a polyene series that also forms stable bipolarons, and are intensely fluorescent. Dithienylpolyenes also form exceptionally stable bipolarons, and have been shown to have large two-photon cross-sections. These new chromophores can be easily attached to 3,5-dihydroxybenzyl alc. to form intermediary dendrons capable of attachment to a variety of core mols. to yield functionalized **dendrimers**. Both the dendrons and G-0 **dendrimers** obtained from a core of bisphenol A form bipolarons upon oxidative doping in solution that are essentially identical to those formed from the chromophores themselves. **Dendrimers** based on bis-(diphenylamino)diphenylpolyene repeat units have also been previously reported and been shown to have extremely large two-photon cross-sections for nanosecond laser pulses. We have now been able to synthesize new **dendrimer** structures in which P replaces N. These new materials have spectra which are dramatically blue-shifted when compared to their N-counterparts (ca. 30-40 nm). In this presentation we will illustrate the synthesis and characterization of these new dendrons and **dendrimers**, as well as their applicability for optical power limiting applications and as photoluminescent materials suitable for organic light-emitting diodes (OLEDs).

L4 ANSWER 24 OF 29 CAPLUS COPYRIGHT 2005 ACS on STN
AN 2000:334550 CAPLUS
TI Design and synthesis of new photon-gathering **dendrimers**.
AU **Spangler, Charles W.**; Elandaloussi, El Hadj; Reeves, Benjamin
CS Department of Chemistry and Biochemistry, Optical Technology Center, Montana State University, Bozeman, MT, 59717, USA
SO Book of Abstracts, 219th ACS National Meeting, San Francisco, CA, March

26-30, 2000 (2000), POLY-369 Publisher: American Chemical Society, Washington, D. C.
CODEN: 69CLAC
DT Conference; Meeting Abstract
LA English
AB There has been considerable recent interest in the design, synthesis and characterization of new organic chromophores and polymers with potentially large two-photon cross-sections for a variety of photonic applications. One particularly attractive system is based on poly[phenylene vinylene] (PPV) oligomers containing electron-donating substituents. We have recently synthesized several PPV dimer chromophores with bis-(diphenylamino) substituents attached to the terminal Ph rings, and have demonstrated that these materials have very large two-photon cross-sections for nanosecond laser pulses. We have now synthesized several G-0 **dendrimers** based on bis-(diphenylamino)-E-stilbene and PPV dimer repeat units. These model **dendrimers** have extraordinarily large two-photon cross-sections for ns laser pulses which we have ascribed to probable excited-state absorption from polaronic or bipolaronic transient charge state formation. The efficacy of this design approach will be presented, as well as future design paradigms for even greater TPA enhancement.

L4 ANSWER 25 OF 29 CAPLUS COPYRIGHT 2005 ACS on STN
AN 2000:334521 CAPLUS
TI Recent developments in the design of new two-photon-absorber chromophores.
AU **Spangler, Charles W.**
CS Department of Chemistry and Biochemistry and Optical Technology Center, Montana State University, Bozeman, MT, 59717, USA
SO Book of Abstracts, 219th ACS National Meeting, San Francisco, CA, March 26-30, 2000 (2000), POLY-341 Publisher: American Chemical Society, Washington, D. C.
CODEN: 69CLAC
DT Conference; Meeting Abstract
LA English
AB During the past five years there has been considerable progress in the design of new chromophores for specific photonic applications. In the area of optical power limiting, for example, much effort has been focused on the design of new chromophores displaying excited state asorption whose cross-sections are considerable larger than the original ground state absorption (reverse saturable absorption). However, more recently equally intriguing new approaches to designing chromophores with large two-photon cross-sections have been explored by several research groups, leading to several new design paradigms which have produced new chromophores with greatly enhanced two-photon absorption (TPA). In this presentation we will review our recent success in this area utilizing **dendrimers** whose structures are based on bis-(diphenylamino)diphenylpolyene repeat units. These new materials not only have large intrinsic TPA, but the initial excitation also gives access to transient highly absorbing species which further enhance the effective two-photon cross-section. It now seems possible to combine these two optical limiting mechanisms in single chromophore structures, thus giving rise to a new class of materials which we have named "bimechanistic optical power limiters".

L4 ANSWER 26 OF 29 CAPLUS COPYRIGHT 2005 ACS on STN
AN 2000:36379 CAPLUS
DN 133:89901
TI Model dendrons and **dendrimers** incorporating diphenylamino-substituted diphenylpolyene and PPV-oligomer moieties for NLO applications
AU Ashworth, Kimba; **Spangler, Charles W.**; Reeves, Benjamin
CS Dep. Chem. Biochem., Montana State Univ., Bozeman, MT, USA
SO Proceedings of SPIE-The International Society for Optical Engineering (1999), 3796(Organic Nonlinear Optical Materials), 170-177
CODEN: PSISDG; ISSN: 0277-786X
PB SPIE-The International Society for Optical Engineering
DT Journal
LA English
AB The synthesis and characterization are described of diphenylamino-substituted diphenylpolyene and poly(p-phenylenevinylene)s as two-photon absorbers, photoluminescent materials suitable for organic light- emitting

diodes, and as **dendrimers** capable of 3D charge delocalization and exceptionally large third order hyperpolarizability. Bis-(diphenylamino)diphenylpolyenes form exceptionally stable, highly absorbing bipolaronic dications in solution and thin film. Replacement of one diphenylamino substituent with a N-(hydroxyethyl), N-ethylaminophenyl moiety yields a polyene that also forms stable bipolarons which are intensely fluorescent. These chromophores are easily attached to either a PMMA backbone or to 3,5-dihydroxybenzyl alc. to yield functionalized dendrons capable of attachment to various core mols. Diphenylamino-substituted PPV oligomers can also be obtained with similar functionality. These materials possess large two-photon cross-sections and display optical limiting for nanosecond pulses with peak activity extending into the visible portion of the spectrum.

RE.CNT 12 THERE ARE 12 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L4 ANSWER 27 OF 29 CAPLUS COPYRIGHT 2005 ACS on STN
AN 1999:777810 CAPLUS
DN 132:308748
TI Design and synthesis of new optical-power-limiting chromophores with enhanced two-photon absorption
AU **Spangler, Charles W.**; Elandaloussi, El Hadj; Casstevens, Martin K.; Kumar, Deepak N.; Weibel, John F.; Burzynski, Ryszard
CS Optical Technology Ctr., Dep. Chem. Biochem., Montana State Univ./Bozeman, Bozeman, MT, USA
SO Proceedings of SPIE-The International Society for Optical Engineering (1999), 3798(Power-Limiting Materials and Devices), 117-122
CODEN: PSISDG; ISSN: 0277-786X
PB SPIE-The International Society for Optical Engineering
DT Journal
LA English
AB There has been considerable recent interest in the design of new organic chromophores, oligomers and polymers with potentially large two-photon cross-sections for a variety of applications that span such diverse areas as photo-dynamic therapy to optical power limiting of nanosecond and picosecond laser pulses. One particularly attractive system is based on poly[p-phenylenevinylene] (PPV) oligomers containing electron-donating substituents. Several PPV dimers with bis(diphenylamino) donor groups attached to the terminal Ph rings were synthesized and shown to have very large two-photon cross-sections for nanosecond pulses. It is probable that these enhanced cross-sections are due to excited state absorption following the initial two-photon absorption. Bis(diphenylamino)diphenylpolyenes and **dendrimer** structures based on bis(diphenylamino)stilbene repeat units were also studied. Initial studies on the **dendrimer** structures and bis(diphenylamino)-PPV dimer revealed extremely large two-photon cross-sections which have been ascribed to probable excited-state absorption. The efficacy of this design approach is discussed, as well as projected future design paradigms for even greater TPA enhancement.

RE.CNT 11 THERE ARE 11 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L4 ANSWER 28 OF 29 CAPLUS COPYRIGHT 2005 ACS on STN
AN 1998:532266 CAPLUS
DN 129:260977
TI Charge state generation in **dendrimer** models based on triphenylaminopolyenylic building blocks
AU Elandaloussi, El Hadj; **Spangler, Charles W.**
CS Dep. Chem. Biochem., Montana State Univ., Bozeman, MT, 59717, USA
SO Polymer Preprints (American Chemical Society, Division of Polymer Chemistry) (1998), 39(2), 1055-1056
CODEN: ACPPAY; ISSN: 0032-3934
PB American Chemical Society, Division of Polymer Chemistry
DT Journal
LA English
AB There has been considerable recent interest in the use of dendritic materials for photonics applications. Diphenylamino-substituted polyenes were recently shown to form exceptionally stable and highly absorbing

bipolaron-like dications. Similar materials were also shown to be excellent hole-transporting layers in LED devices. The design and synthesis of several new **dendrimer** models based on bis(diphenylamino)stilbene repeat units coupled to a variety of different core mols. is reported. Oxidative doping of these models yield stable charge states which may have important applications in optical power limiting as well as enhanced third order nonlinear optical response.

RE.CNT 7 THERE ARE 7 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L4 ANSWER 29 OF 29 CAPLUS COPYRIGHT 2005 ACS on STN
AN 1998:528272 CAPLUS
TI Charge state generation in **dendrimer** models based on triphenylaminopolyenylic building blocks.
AU Elandaloussi, El Hadj; **Spangler, Charles W.**
CS Department Chemistry and Biochemistry, Montana State University, Bozeman, MT, 59717, USA
SO Book of Abstracts, 216th ACS National Meeting, Boston, August 23-27 (1998), POLY-561 Publisher: American Chemical Society, Washington, D. C. CODEN: 66KYA2
DT Conference; Meeting Abstract
LA English
AB There has been considerable recent interest in the use of dendritic materials for photonics applications. Diphenylamino-substituted polyenes have recently been shown to form exceptionally stable and highly absorbing bipolaron-like dications. Similar materials have also been shown to be excellent hole-transporting layers in LED devices. We would like to report the design and synthesis of several new **dendrimer** models based on bis-(diphenylamino)stilbene repeat units coupled to a variety of different core mols. Oxidative doping of these models yield stable charge states which may have important applications in optical power limiting as well as enhanced third order nonlinear optical response.

```
=> s promiscuous O-linked-glycosyltransferase?
L1            0 PROMISCUOUS O-LINKED-GLYCOSYLTRANSFERASE?

=> s dendrimer? and linker? and hydrophilic and polymer?
L2          547 DENDRIMER? AND LINKER? AND HYDROPHILIC AND POLYMER?

=> dup rem l2
PROCESSING COMPLETED FOR L2
L3          545 DUP REM L2 (2 DUPLICATES REMOVED)

=> s l3 and (attachment moiet?)
L4            0 L3 AND (ATTACHMENT MOIET?)

=> s l3 and (attachment)
L5          423 L3 AND (ATTACHMENT)

=> s l5 and (polyethylene glycol)
L6          286 L5 AND (POLYETHYLENE GLYCOL)

=> s l6 and (hydrophilic polymer)
L7           37 L6 AND (HYDROPHILIC POLYMER)

=> d bib ab 1-
YOU HAVE REQUESTED DATA FROM 37 ANSWERS - CONTINUE? Y/(N):y

L7   ANSWER 1 OF 37  USPATFULL on STN
AN     2005:75298  USPATFULL
TI     Lipid encapsulated interfering RNA
IN     MacLachlan, Ian, Vancouver, CANADA
       Ambegia, Ellen Grace, Vancouver, CANADA
       Heyes, James, Vancouver, CANADA
PA     Protiva Biotherapeutics, Inc., Burnaby, CANADA (non-U.S. corporation)
PI     US 2005064595     A1   20050324
AI     US 2004-893121    A1   20040716 (10)
PRAI   US 2003-529406P     20031211 (60)
       US 2003-503279P     20030915 (60)
       US 2003-488144P     20030716 (60)
DT     Utility
FS     APPLICATION
LREP   TOWNSEND AND TOWNSEND AND CREW, LLP, TWO EMBARCADERO CENTER, EIGHTH
       FLOOR, SAN FRANCISCO, CA, 94111-3834
CLMN   Number of Claims: 51
ECL    Exemplary Claim: 1
DRWN   22 Drawing Page(s)
LN.CNT 3126
AB     The present invention provides compositions and methods for silencing
       gene expression by delivering nucleic acid-lipid particles comprising a
       siRNA molecule to a cell.

L7   ANSWER 2 OF 37  USPATFULL on STN
AN     2005:63534  USPATFULL
TI     Methods for modulating a drug-related effect or behavior
IN     Messing, Robert O., Foster City, CA, UNITED STATES
       Newton, Philip M., San Francisco, CA, UNITED STATES
PA     The Regents of the University of California (U.S. corporation)
PI     US 2005054574     A1   20050310
AI     US 2004-913697    A1   20040805 (10)
PRAI   US 2003-493960P     20030808 (60)
DT     Utility
FS     APPLICATION
LREP   QUINE INTELLECTUAL PROPERTY LAW GROUP, P.C., P O BOX 458, ALAMEDA, CA,
       94501
CLMN   Number of Claims: 40
ECL    Exemplary Claim: 1
DRWN   7 Drawing Page(s)
LN.CNT 2398
CAS INDEXING IS AVAILABLE FOR THIS PATENT.
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AB The present invention provides a method of reducing or preventing a drug-related effect or behavior in a subject by inhibiting N-type calcium channels. In addition, the invention provides a variety of prescreening and screening methods aimed at identifying agents that modulate a drug-related effect or behavior. These methods involve assaying test agent binding to N-type calcium channels or channel subunits. Alternatively, test agents can be screened for their ability to alter the level of N-type calcium channels, channel subunit polypeptide or RNA, or the depolarization-induced inward calcium current mediated by these channels. Finally, the invention also provides a diagnostic method that entails measuring one or more of these levels and determining risk for a drug-related effect or behavior based on comparison to the corresponding level for a control population.

L7 ANSWER 3 OF 37 USPATFULL on STN
AN 2005:30367 USPATFULL
TI Medical device with low magnetic susceptibility
IN Wang, Xingwu, Wellsville, NY, UNITED STATES
Greenwald, Howard Jay, Rochester, NY, UNITED STATES
PI US 2005025797 A1 20050203
AI US 2004-887521 A1 20040707 (10)
RLI Continuation-in-part of Ser. No. US 2004-867517, filed on 14 Jun 2004, PENDING Continuation-in-part of Ser. No. US 2004-810916, filed on 26 Mar 2004, PENDING Continuation-in-part of Ser. No. US 2004-808618, filed on 24 Mar 2004, PENDING Continuation-in-part of Ser. No. US 2004-786198, filed on 25 Feb 2004, PENDING Continuation-in-part of Ser. No. US 2004-780045, filed on 17 Feb 2004, PENDING Continuation-in-part of Ser. No. US 2003-747472, filed on 29 Dec 2003, PENDING Continuation-in-part of Ser. No. US 2003-744543, filed on 22 Dec 2003, PENDING Continuation-in-part of Ser. No. US 2003-442420, filed on 21 May 2003, PENDING Continuation-in-part of Ser. No. US 2003-409505, filed on 8 Apr 2003, GRANTED, Pat. No. US 6815609
DT Utility
FS APPLICATION
LREP HOWARD J. GREENWALD P.C., 349 W. COMMERCIAL STREET SUITE 2490, EAST ROCHESTER, NY, 14445-2408
CLMN Number of Claims: 137
ECL Exemplary Claim: 1
DRWN 42 Drawing Page(s)
LN.CNT 17461
AB An assembly that contains a medical device and biological material within which the medical device is disposed. The assembly has a magnetic susceptibility within the range of plus or minus 1+10.sup.-3 centimeter-gram-seconds

L7 ANSWER 4 OF 37 USPATFULL on STN
AN 2005:30349 USPATFULL
TI HIV-1 envelope glycoproteins having unusual disulfide structure
IN Berman, Phillip W., Portola Valley, CA, UNITED STATES
Jobes, David V., Redwood City, CA, UNITED STATES
PA VaxGen, Inc. (U.S. corporation)
PI US 2005025779 A1 20050203
AI US 2004-866527 A1 20040610 (10)
PRAI US 2003-477815P 20030612 (60)
DT Utility
FS APPLICATION
LREP QUINE INTELLECTUAL PROPERTY LAW GROUP, P.C., P O BOX 458, ALAMEDA, CA, 94501
CLMN Number of Claims: 63
ECL Exemplary Claim: 1
DRWN 10 Drawing Page(s)
LN.CNT 9511
CAS INDEXING IS AVAILABLE FOR THIS PATENT.
AB The present invention provides HIV-1 envelope glycoproteins having unusual disulfide structure. In particular, the invention includes gp120 polypeptides, and polynucleotides encoding such polypeptides, as well as related vectors, host cells, and expression methods. The invention also encompasses immunogenic compositions containing gp120 polypeptides or

polynucleotides and their use in eliciting a gp120-specific immune response. gp120 polypeptides and polynucleotides of the invention are also useful in diagnostic methods of the invention.

L7 ANSWER 5 OF 37 USPATFULL on STN
AN 2005:17501 USPATFULL
TI Thiol selective water soluble **polymer** derivatives
IN Kozlowski, Antoni, Huntsville, AL, UNITED STATES
Gross, Remy F., III, Huntsville, AL, UNITED STATES
McManus, Samuel P., Brevard, NC, UNITED STATES
PI US 2005014903 A1 20050120
AI US 2004-753047 A1 20040106 (10)
PRAI US 2003-438555P 20030106 (60)
US 2003-455084P 20030314 (60)
DT Utility
FS APPLICATION
LREP NEKTAR THERAPEUTICS, 150 INDUSTRIAL ROAD, SAN CARLOS, CA, 94070
CLMN Number of Claims: 63
ECL Exemplary Claim: 1
DRWN No Drawings
LN.CNT 2474
CAS INDEXING IS AVAILABLE FOR THIS PATENT.
AB The present invention provides water-soluble, **polymer** derivatives having a thiol-selective terminus suitable for selective coupling to thiol groups, such as those contained in the cysteine residues of proteins.

L7 ANSWER 6 OF 37 USPATFULL on STN
AN 2004:335597 USPATFULL
TI Formation of novel erythropoietin conjugates using transglutaminase
IN Pool, Chadler, Phoenixville, PA, UNITED STATES
PI US 2004266690 A1 20041230
AI US 2004-854854 A1 20040527 (10)
PRAI US 2003-475074P 20030530 (60)
DT Utility
FS APPLICATION
LREP PHILIP S. JOHNSON, JOHNSON & JOHNSON, ONE JOHNSON & JOHNSON PLAZA, NEW BRUNSWICK, NJ, 08933-7003
CLMN Number of Claims: 48
ECL Exemplary Claim: 1
DRWN 13 Drawing Page(s)
LN.CNT 1255
CAS INDEXING IS AVAILABLE FOR THIS PATENT.
AB The invention provides biologically active erythropoietin (EPO) conjugate compositions wherein a transglutaminase reaction is employed to covalently and site specifically conjugate the EPO molecule to a non-antigenic **hydrophilic polymer** that can also be covalently linked to an organic molecule either of which modification increases the circulating serum half-life of the composition.

L7 ANSWER 7 OF 37 USPATFULL on STN
AN 2004:321764 USPATFULL
TI Therapeutic assembly
IN Wang, Xingwu, Wellsville, NY, UNITED STATES
Greenwald, Howard J., Rochester, NY, UNITED STATES
Lanzafame, John, Victor, NY, UNITED STATES
Weiner, Michael L., Webster, NY, UNITED STATES
Connelly, Patrick R., Rochester, NY, UNITED STATES
PI US 2004254419 A1 20041216
AI US 2004-867517 A1 20040614 (10)
RLI Continuation-in-part of Ser. No. US 2004-810916, filed on 26 Mar 2004, PENDING Continuation-in-part of Ser. No. US 2004-808618, filed on 24 Mar 2004, PENDING Continuation-in-part of Ser. No. US 2004-786198, filed on 25 Feb 2004, PENDING Continuation-in-part of Ser. No. US 2004-780045, filed on 17 Feb 2004, PENDING Continuation-in-part of Ser. No. US 2003-747472, filed on 29 Dec 2003, PENDING Continuation-in-part of Ser. No. US 2003-744543, filed on 22 Dec 2003, PENDING Continuation-in-part of Ser. No. US 2003-409505, filed on 8 Apr 2003, PENDING

Continuation-in-part of Ser. No. US 2003-442420, filed on 21 May 2003, PENDING
DT Utility
FS APPLICATION
LREP HOWARD J. GREENWALD P.C., 349 W. COMMERCIAL STREET SUITE 2490, EAST ROCHESTER, NY, 14445-2408
CLMN Number of Claims: 175
ECL Exemplary Claim: CLM-1-177
DRWN 40 Drawing Page(s)
LN.CNT 16208
AB A therapeutic assembly that contains a therapeutic agent, a ctyotoxic radioactive material, and a nanomagnetic material with nanomagnetic particles. The nanomagentic particles have an average particle size of less than about 100 nanometers; and the average coherence length between adjacent nanomagnetic particles is less than 100 nanometers. The nanomagnetic material has a saturation magentization of from about 2 to about 3000 electromagnetic units per cubic centimeter, a phase transition temperature of from about 40 to about 200 degrees Celsius, and a saturation magnetization of from about 2 to about 3,000 electromagnetic units per cubic centimeter

L7 ANSWER 8 OF 37 USPATFULL on STN
AN 2004:317309 USPATFULL
TI Membrane-associated protein 17KD (MAP17)-interacting protein and use thereof
IN Bartel, Paul, Salt Lake City, UT, United States
PA Myriad Genetics, Inc., Salt Lake City, UT, United States (U.S. corporation)
PI US 6831154 B1 20041214
AI US 2002-146710 20020514 (10)
PRAI US 2001-291221P 20010516 (60)
DT Utility
FS GRANTED
EXNAM Primary Examiner: Carlson, Karen Cochrane; Assistant Examiner: Desai, Anand
LREP Baker, Jonathan A., Zhang, Jay Z., Myriad IP Dept.
CLMN Number of Claims: 12
ECL Exemplary Claim: 1
DRWN 0 Drawing Figure(s); 0 Drawing Page(s)
LN.CNT 4412
CAS INDEXING IS AVAILABLE FOR THIS PATENT.
AB Protein complexes are provided comprising MAP17 and SCAMP2. The protein complexes are useful in screening assays for identifying compounds effective in modulating the protein complexes and in treating and/or preventing diseases and disorders associated with MAP17 and SCAMP2. In addition, methods for detecting the protein complexes and modulating the functions and activities of the protein complexes or interacting members thereof are also provided.

L7 ANSWER 9 OF 37 USPATFULL on STN
AN 2004:315453 USPATFULL
TI Aptamer-toxin molecules and methods for using same
IN Stanton, Martin, Concord, MA, UNITED STATES
Kurz, Markus, Newton, MA, UNITED STATES
Wilson, Charles, Concord, MA, UNITED STATES
PI US 2004249130 A1 20041209
AI US 2004-826077 A1 20040415 (10)
RLI Continuation-in-part of Ser. No. US 2003-600007, filed on 18 Jun 2003, PENDING
PRAI US 2002-390042P 20020618 (60)
DT Utility
FS APPLICATION
LREP MINTZ, LEVIN, COHN, FERRIS, GLOVSKY, AND POPEO, P.C., ONE FINANCIAL CENTER, BOSTON, MA, 02111
CLMN Number of Claims: 18
ECL Exemplary Claim: 1
DRWN 5 Drawing Page(s)
LN.CNT 3399

CAS INDEXING IS AVAILABLE FOR THIS PATENT.
AB Materials and methods are provided to prepare therapeutic conjugates for the treatment of proliferative diseases. The therapeutic conjugates of the invention comprise a targeting moiety conjugated to a therapeutic moiety. The therapeutic moiety of the conjugates of the present invention have a cytotoxic effect and are useful in the treatment of proliferative diseases.

L7 ANSWER 10 OF 37 USPATFULL on STN
AN 2004:313954 USPATFULL
TI Methods of making pharmaceutical formulations for the delivery of drugs having low aqueous solubility
IN Unger, Evan Charles, Tucson, AZ, UNITED STATES
Ramaswami, VaradaRajan, Tucson, AZ, UNITED STATES
Zutshi, Reena, Tucson, AZ, UNITED STATES
LaBell, Rachel Yvonne, Vail, AZ, UNITED STATES
Pigman, Elizabeth Anne, Tucson, AZ, UNITED STATES
PI US 2004247624 A1 20041209
AI US 2003-456193 A1 20030605 (10)
DT Utility
FS APPLICATION
LREP REED & EBERLE LLP, 800 MENLO AVENUE, SUITE 210, MENLO PARK, CA, 94025
CLMN Number of Claims: 97
ECL Exemplary Claim: 1
DRWN 2 Drawing Page(s)
LN.CNT 2904
CAS INDEXING IS AVAILABLE FOR THIS PATENT.
AB Methods are provided that for producing aqueous formulations of pharmaceutical agents having low aqueous solubility. The methods also provide a simple means of producing the formulation as a sterile product. The drug is physically entrapped by a spatially stabilized matrix comprising a **hydrophilic** or **hydrophilic** -hydrophobic block **polymer**, without being covalently bound to the **polymer**. The drug formulation is a nanoparticle or sub-nanoparticle in size. In a preferred embodiment the nanoparticles are anisotropic, being much longer than they are wide.

L7 ANSWER 11 OF 37 USPATFULL on STN
AN 2004:310055 USPATFULL
TI VAMP-associated protein A-interacting proteins and use thereof
IN Sugiyama, Janice, Salt Lake City, UT, United States
PA Myriad Genetics, Inc., Salt Lake City, UT, United States (U.S. corporation)
PI US 6828421 B1 20041207
AI US 2002-146704 20020514 (10)
PRAI US 2001-291730P 20010517 (60)
DT Utility
FS GRANTED
EXNAM Primary Examiner: Carlson, Karen Cochrane; Assistant Examiner: Desai, Anand U
LREP Baker, Jonathan A., Zhang, Jay Z., Myriad IP Dept.
CLMN Number of Claims: 12
ECL Exemplary Claim: 1
DRWN 0 Drawing Figure(s); 0 Drawing Page(s)
LN.CNT 4694
CAS INDEXING IS AVAILABLE FOR THIS PATENT.
AB Protein complexes are provided comprising VAP-A and one or more VAP-A-interacting proteins. The protein complexes are useful in screening assays for identifying compounds effective in modulating the protein complexes and in treating and/or preventing diseases and disorders associated with VAP-A and its interacting partners. In addition, methods of detecting the protein complexes and modulating the functions and activities of the protein complexes or interacting members thereof are also provided.

L7 ANSWER 12 OF 37 USPATFULL on STN
AN 2004:287884 USPATFULL
TI Compositions and methods for treating neurological disorders and

diseases
IN Roch, Jean-Marc, Salt Lake City, UT, UNITED STATES
Bartel, Paul, Salt Lake City, UT, UNITED STATES
Heichman, Karen, Salt Lake City, UT, UNITED STATES
PA Myriad Genetics, Incorporated, Salt Lake City, UT, UNITED STATES (U.S. corporation)
PI US 2004226056 A1 20041111
AI US 2004-776013 A1 20040209 (10)
RLI Continuation-in-part of Ser. No. US 2001-948904, filed on 10 Sep 2001, ABANDONED Division of Ser. No. US 1999-466139, filed on 21 Dec 1999, ABANDONED Continuation-in-part of Ser. No. US 2001-975072, filed on 12 Oct 2001, ABANDONED Continuation-in-part of Ser. No. US 2002-194967, filed on 15 Jul 2002, PENDING
PRAI US 1998-113534P 19981222 (60)
US 1999-124120P 19990312 (60)
US 1999-141243P 19990630 (60)
US 2000-240790P 20001017 (60)
US 2001-304775P 20010713 (60)
DT Utility
FS APPLICATION
LREP MYRIAD GENETICS INC., LEGAL DEPARTMENT, 320 WAKARA WAY, SALT LAKE CITY, UT, 84108
CLMN Number of Claims: 19
ECL Exemplary Claim: 1
DRWN 28 Drawing Page(s)
LN.CNT 12774
CAS INDEXING IS AVAILABLE FOR THIS PATENT.
AB The present invention generally relates to methods and compositions for treating neurological disorders and diseases. In addition, methods for selecting therapeutic agents useful for treating neurological disorders and diseases are provided.

L7 ANSWER 13 OF 37 USPATFULL on STN
AN 2004:280784 USPATFULL
TI Compositions for nucleic acid delivery
IN Sandhu, Jasbir, Burlington, CANADA
PI US 2004220085 A1 20041104
AI US 2003-429662 A1 20030502 (10)
DT Utility
FS APPLICATION
LREP Michael A. Slavin, Esq., McHale & Slavin, P.A., Suite 402, 4440 PGA Boulevard, Palm Beach Gardens, FL, 33410
CLMN Number of Claims: 36
ECL Exemplary Claim: 1
DRWN 6 Drawing Page(s)
LN.CNT 1560
CAS INDEXING IS AVAILABLE FOR THIS PATENT.
AB The invention provides compositions containing at least one ligand such as human epidermal growth factor (EGF) or human vascular endothelial growth factor (VEGF), a nucleic acid and a human transferrin ligand. The compositions are useful for the multi-targeted delivery of nucleic acids to cells and tissues.

L7 ANSWER 14 OF 37 USPATFULL on STN
AN 2004:280783 USPATFULL
TI Methods for nucleic acid delivery
IN Sandhu, Jasbir, Burlington, CANADA
PI US 2004220084 A1 20041104
AI US 2003-429660 A1 20030502 (10)
DT Utility
FS APPLICATION
LREP Michael A. Slavin, Esq., McHale & Slavin, P.A., Suite 402, 4440 PGA Boulevard, Palm Beach Gardens, FL, 33410
CLMN Number of Claims: 18
ECL Exemplary Claim: 1
DRWN 6 Drawing Page(s)
LN.CNT 1540
CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB The invention provides methods useful for the multi-targeted delivery of nucleic acids to cells and tissues. The methods of the invention involve the administration of compositions containing at least one ligand such as human epidermal growth factor (EGF) or human vascular endothelial growth factor (VEGF), a nucleic acid and a human transferrin ligand to a host having cells to which nucleic acids can be delivered.

L7 ANSWER 15 OF 37 USPATFULL on STN
AN 2004:273757 USPATFULL
TI Compositions and methods for treating diabetes
IN Heichman, Karen, Salt Lake City, UT, UNITED STATES
Bartel, Paul, Salt Lake City, UT, UNITED STATES
Sugiyama, Janice, Salt Lake City, UT, UNITED STATES
PA Myriad Genetics, Incorporated, Salt Lake City, UT (U.S. corporation)
PI US 2004214255 A1 20041028
AI US 2003-639067 A1 20030811 (10)
RLI Continuation-in-part of Ser. No. US 2000-556941, filed on 21 Apr 2000, ABANDONED
PRAI US 1999-130389P 19990422 (60)
US 1999-140693P 19990624 (60)
US 1999-156947P 19990930 (60)
US 1999-163073P 19991102 (60)
US 1999-168378P 19991202 (60)
US 1999-168376P 19991202 (60)
DT Utility
FS APPLICATION
LREP MYRIAD GENETICS INC., LEGAL DEPARTMENT, 320 WAKARA WAY, SALT LAKE CITY, UT, 84108
CLMN Number of Claims: 8
ECL Exemplary Claim: 1
DRWN 74 Drawing Page(s)
LN.CNT 8425
CAS INDEXING IS AVAILABLE FOR THIS PATENT.
AB Protein complexes are provided comprising at least one interacting pair of proteins. The protein complexes are useful in screening assays for identifying compounds effective in modulating the protein complexes, and in treating and/or preventing diseases and disorders associated with the protein complexes and/or their constituent interacting members.

L7 ANSWER 16 OF 37 USPATFULL on STN
AN 2004:257008 USPATFULL
TI Uniform molecular weight **polymers**
IN Brocchini, Stephen James, London, UNITED KINGDOM
Godwin, Antony, Bristol, UNITED KINGDOM
PA Polytherics Limited, UNITED KINGDOM (non-U.S. corporation)
PI US 6803438 B1 20041012
WO 2001018080 20010315
AI US 2002-70318 20020809 (10)
WO 2000-GB3456 20000908
PRAI EP 1999-307152 19990908
DT Utility
FS GRANTED
EXNAM Primary Examiner: Pezzuto, Helen L.
LREP Dickstein, Shapiro, Morin & Oshinsky, LLP.
CLMN Number of Claims: 49
ECL Exemplary Claim: 1
DRWN 12 Drawing Figure(s); 12 Drawing Page(s)
LN.CNT 1573
CAS INDEXING IS AVAILABLE FOR THIS PATENT.
AB A **polymer** comprising the unit (I) wherein R is selected form the group consisting of hydrogen, C.sub.1-C.sub.18 alkyl, C.sub.1-C.sub.18 aralkyl, C.sub.1-C.sub.18 alkaryl, carboxylic acid, carboxy-C.sub.1-6alkyl, or any one of the C.sub.1-C.sub.18 alkyl, C.sub.1-C.sub.18 alkenyl, C.sub.1-C.sub.18 aralkyl, C.sub.1-C.sub.18 alkaryl substituted with a heteroatom within, or attached to, the carbon backbone; R.sup.1 is selected from the group consisting of hydrogen, C.sub.1-C.sub.6 alkyl groups; X is an acylating agent and wherein the **polymer** has a polydispersity of less than 1.4, preferably less

than 1.2 and a molecular weight (Mw) of less than 100,000, the **polymer** is preferably made by controlled radical **polymerization** and is useful in the production of **polymer** drug conjugates with desirable biological profiles.

L7 ANSWER 17 OF 37 USPATFULL on STN
AN 2004:184976 USPATFULL
TI Methods and compositions for modulating agonist-induced downregulation of G protein-coupled receptors
IN Whistler, Jennifer L., El Cerrito, CA, UNITED STATES
von Zastrow, Mark, San Carlos, CA, UNITED STATES
Murray, Stephen R., New York, NY, UNITED STATES
PA The Regents of the University of California (U.S. corporation)
PI US 2004142862 A1 20040722
AI US 2003-622373 A1 20030718 (10)
PRAI US 2002-397048P 20020719 (60)
DT Utility
FS APPLICATION
LREP QUINE INTELLECTUAL PROPERTY LAW GROUP, P.C., P O BOX 458, ALAMEDA, CA, 94501
CLMN Number of Claims: 78
ECL Exemplary Claim: 1
DRWN 18 Drawing Page(s)
LN.CNT 3564
CAS INDEXING IS AVAILABLE FOR THIS PATENT.
AB The present invention provides polypeptides (termed "GASP") that modulate post-endocytic sorting of a variety of G protein-coupled receptors, thereby modulating agonist-induced downregulation of such receptors. The invention also provides methods of modulating agonist-induced downregulation of G protein-coupled receptors, as well as GASP polypeptides and anti-GASP antibodies. In addition, the invention provides a delta opioid receptor (DOR) polypeptide containing the GASP binding domain. The invention encompasses related polynucleotides, vectors, host cells, production methods, and compositions. Moreover, the invention includes methods for prescreening or screening for test agents that modulate agonist-induced downregulation of G protein-coupled receptors.

L7 ANSWER 18 OF 37 USPATFULL on STN
AN 2004:144197 USPATFULL
TI TSG101-GAG interaction and use thereof
IN Zavitz, Kenton, Salt Lake City, UT, UNITED STATES
Morham, Scott, Salt Lake City, UT, UNITED STATES
Wettstein, Daniel Albert, Salt Lake City, UT, UNITED STATES
PA Myriad Genetics, Incorporated, Salt Lake City, UT, UNITED STATES (U.S. corporation)
PI US 2004109861 A1 20040610
AI US 2003-663407 A1 20030915 (10)
RLI Continuation-in-part of Ser. No. WO 2002-US8146, filed on 14 Mar 2002, PENDING Continuation-in-part of Ser. No. US 2002-223172, filed on 19 Aug 2002, PENDING Continuation-in-part of Ser. No. US 2002-224999, filed on 20 Aug 2002, PENDING
PRAI US 2001-276259P 20010314 (60)
US 2001-313239P 20010818 (60)
US 2001-313695P 20010820 (60)
DT Utility
FS APPLICATION
LREP MYRIAD GENETICS INC., LEGAL DEPARTMENT, 320 WAKARA WAY, SALT LAKE CITY, UT, 84108
CLMN Number of Claims: 19
ECL Exemplary Claim: 1
DRWN 8 Drawing Page(s)
LN.CNT 4490
CAS INDEXING IS AVAILABLE FOR THIS PATENT.
AB Isolated protein complexes are provided comprising Tsg101 and HIV GAG or GAGp6. The protein complexes are useful in screening assays for selecting compounds effective in modulating the Tsg101-HIV GAG or GAGp6 interaction within the protein complexes.

L7 ANSWER 19 OF 37 USPATFULL on STN
AN 2004:63373 USPATFULL
TI Systems devices and methods for intrabody targeted delivery and reloading of therapeutic agents
IN Glozman, Sabina, Rehovot, ISRAEL
Beserman, Zur Pierre, Emek Sorek, ISRAEL
Morik, Yosi, Chicago, ISRAEL
PI US 2004047891 A1 20040311
AI US 2003-416542 A1 20030513 (10)
WO 2002-IL149 20020226
DT Utility
FS APPLICATION
LREP G.E. Ehrlich, Anthony Castorina, 2001 Jefferson Davis Highway, Suite 207, Arlington, VA, 22202
CLMN Number of Claims: 40
ECL Exemplary Claim: 1
DRWN 7 Drawing Page(s)
LN.CNT 1460
CAS INDEXING IS AVAILABLE FOR THIS PATENT.
AB A biomedical system for targeted delivery of a therapeutic agent to a tissue region of a subject is provided. The biomedical system comprises: (a) a biomedical device including: (i) a device body designed and configured for implantation within the tissue region of the subject; and (ii) a first member of a binding pair attached to a surface of said device body; and (b) a delivery vehicle including: (i) a carrier particle designed for carrying the therapeutic agent; (ii) a second member of said binding pair attached to said carrier particle, said second member of said binding pair being capable of specifically interacting with said first member of said binding pair thereby enabling targeting of said delivery vehicle to said biomedical device when implanted within said tissue region.

L7 ANSWER 20 OF 37 USPATFULL on STN
AN 2004:50976 USPATFULL
TI Nanoparticle delivery systems and methods of use thereof
IN Unger, Gretchen, Chaska, MN, UNITED STATES
Lundell, Beverly, Woodbury, MN, UNITED STATES
PA Genesegues, Inc. (U.S. corporation)
PI US 2004038406 A1 20040226
AI US 2003-410659 A1 20030408 (10)
RLI Continuation-in-part of Ser. No. US 2003-378044, filed on 28 Feb 2003, PENDING
PRAI US 2002-394315P 20020708 (60)
US 2002-370882P 20020408 (60)
US 2002-428296P 20021122 (60)
DT Utility
FS APPLICATION
LREP PATTERSON, THUENTE, SKAAR & CHRISTENSEN, P.A., 4800 IDS CENTER, 80 SOUTH 8TH STREET, MINNEAPOLIS, MN, 55402-2100
CLMN Number of Claims: 59
ECL Exemplary Claim: 1
DRWN 15 Drawing Page(s)
LN.CNT 2351
CAS INDEXING IS AVAILABLE FOR THIS PATENT.
AB Certain embodiments of the invention relate to the use of small particles in biological systems, including the delivery of biologically active agents. Some embodiments involve using a collection of particles comprising an agent, a surfactant molecule having an HLB value of less than about 6.0 units, and a **polymer** soluble in aqueous solution, wherein the collection of particles has an average diameter of less than about 200 nanometers, wherein the agent is a protein, carbohydrate, polypeptide, adjuvant, nucleic acid encoding a protein, visualization agent, and/or a marker.

L7 ANSWER 21 OF 37 USPATFULL on STN
AN 2003:243890 USPATFULL
TI Therapeutic methods for acute myeloid leukemia

IN Lee, Robert J., Columbus, OH, UNITED STATES
Ratnam, Manohar, Toledo, OH, UNITED STATES
PI US 2003170299 A1 20030911
AI US 2003-375888 A1 20030227 (10)
PRAI US 2002-360408P 20020227 (60)
DT Utility
FS APPLICATION
LREP CALFEE HALTER & GRISWOLD, LLP, 800 SUPERIOR AVENUE, SUITE 1400, CLEVELAND, OH, 44114
CLMN Number of Claims: 14
ECL Exemplary Claim: 1
DRWN 16 Drawing Page(s)
LN.CNT 1220
CAS INDEXING IS AVAILABLE FOR THIS PATENT.
AB The invention provides a method for treating leukemia in a patient. The method comprises administering to the patient a substance that increases expression of folate receptor β on leukemia cells in the patient, called a FR-β inducer, and administering a folate-conjugated therapeutic that targets the leukemia cells in the patient. The invention also comprises pharmaceutical compositions containing one or both of a FR-β inducer and a folate-conjugated therapeutic. The invention also provides a kit for use in treating leukemia in a patient, the kit comprising an FR-β inducer and a folate-conjugated therapeutic

L7 ANSWER 22 OF 37 USPATFULL on STN
AN 2003:238443 USPATFULL
TI Novel colloid synthetic vectors for gene therapy
IN Woodle, Martin C., Bethesda, MD, UNITED STATES
Cheng, Cheng, Rockville, MD, UNITED STATES
Scaria, Puthupparampil, Montgomery Village, MD, UNITED STATES
Subramanian, Kas, Edison, NJ, UNITED STATES
Titmas, Richard, Boxford, MA, UNITED STATES
Yang, Jingping, N. Potomac, MD, UNITED STATES
Frei, Joerg, Helstein, SWITZERLAND
Mett, Helmut, Neuenburg, GERMANY, FEDERAL REPUBLIC OF
Stanek, Jaroslav, Arlesheim, SWITZERLAND
PI US 2003166601 A1 20030904
AI US 2002-290406 A1 20021106 (10)
RLI Continuation of Ser. No. US 1999-475305, filed on 30 Dec 1999, ABANDONED
DT Utility
FS APPLICATION
LREP THOMAS HOXIE, NOVARTIS, CORPORATE INTELLECTUAL PROPERTY, ONE HEALTH PLAZA 430/2, EAST HANOVER, NJ, 07936-1080
CLMN Number of Claims: 43
ECL Exemplary Claim: 1
DRWN 35 Drawing Page(s)
LN.CNT 4938
CAS INDEXING IS AVAILABLE FOR THIS PATENT.
AB Non-naturally occurring vector for gene therapy are provided, comprised of chemically defined reagents, where the vector is self-assembling and where the vector comprises (1) a core complex comprising a nucleic acid and (2) at least one complex forming reagent, where the vector has fusogenic activity. The vector optionally may contain reagents permitting fusion with cell membranes and nuclear uptake. The vector also may contain an outer shell moiety that is anchored to the core complex, whereby the outer shell stabilizes the complex, protects it from unwanted interactions and enhances delivery of the nucleic acid into a target tissue or cell. The outer shell optionally may be sheddable, that is, it may be designed such that it dissociates from the vector upon entry into the target cell or tissue.

L7 ANSWER 23 OF 37 USPATFULL on STN
AN 2003:64675 USPATFULL
TI Reactions on **dendrimers**
IN Neri, Bruce P., Madison, WI, UNITED STATES
Hall, Jeff G., Madison, WI, UNITED STATES
Lyamichev, Victor, Madison, WI, UNITED STATES

Smith, Lloyd M., Madison, WI, UNITED STATES
PI US 2003044796 A1 20030306
US 6692917 B2 20040217
AI US 2001-940244 A1 20010827 (9)
RLI Continuation-in-part of Ser. No. US 2000-732622, filed on 8 Dec 2000, PENDING Continuation-in-part of Ser. No. US 1999-350309, filed on 9 Jul 1999, GRANTED, Pat. No. US 6348314 Division of Ser. No. US 1996-756386, filed on 26 Nov 1996, GRANTED, Pat. No. US 5985557 Division of Ser. No. US 2000-381212, filed on 8 Feb 2000, PENDING A 371 of International Ser. No. WO 1998-US5809, filed on 24 Mar 1998, UNKNOWN
DT Utility
FS APPLICATION
LREP David A. Casimir, MEDLEN & CARROLL, LLP, Suite 350, 101 Howard Street, San Francisco, CA, 94104
CLMN Number of Claims: 38
ECL Exemplary Claim: 1
DRWN 210 Drawing Page(s)
LN.CNT 15736
CAS INDEXING IS AVAILABLE FOR THIS PATENT.
AB The present invention relates to compositions and methods for the detection and characterization of nucleic acid sequences and variations in nucleic acid sequences. The present invention relates to methods for forming a nucleic acid cleavage structure on **dendrimers** and cleaving the nucleic acid cleavage structure in a site-specific manner. For example, in some embodiments, a 5' nuclease activity from any of a variety of enzymes is used to cleave the target-dependent cleavage structure, thereby indicating the presence of specific nucleic acid sequences or specific variations thereof.

L7 ANSWER 24 OF 37 USPATFULL on STN
AN 2003:57544 USPATFULL
TI Chemokines and methods for inducing the differentiation of fibroblasts to myofibroblasts
IN Martins-Green, Manuela, Riverside, CA, UNITED STATES
Feugate, Jo Ellen, Riverside, CA, UNITED STATES
Li, QiJing, Riverside, CA, UNITED STATES
PI US 2003040109 A1 20030227
AI US 2001-811162 A1 20010316 (9)
DT Utility
FS APPLICATION
LREP QUINE INTELLECTUAL PROPERTY LAW GROUP, P.C., P O BOX 458, ALAMEDA, CA, 94501
CLMN Number of Claims: 86
ECL Exemplary Claim: 1
DRWN 11 Drawing Page(s)
LN.CNT 3786
CAS INDEXING IS AVAILABLE FOR THIS PATENT.
AB This invention is based on the discovery that chemokines induce fibroblasts to differentiate to myofibroblasts, which play a critical role in wound healing and are implicated in a number of fibrotic diseases. This activity has been localized to a peptide in the N-terminus of several chemokines. Accordingly, the invention provides polypeptides that induce the differentiation of fibroblasts to myofibroblasts in vitro and in vivo, nucleic acids encoding such polypeptides and related vectors, host cells, and composition containing these components. The invention also encompasses methods for inducing or inhibiting differentiation of fibroblasts to myofibroblasts, in vivo as well as in vitro, and screening methods for identifying other agents that modulate myofibroblast differentiation.

L7 ANSWER 25 OF 37 USPATFULL on STN
AN 2003:51206 USPATFULL
TI Novel PN9826 nucleic acids and use thereof
IN Wettstein, Daniel Albert, Salt Lake City, UT, UNITED STATES
Mauck, Kimberly A., Sandy, UT, UNITED STATES
PA Myriad Genetics, Incorporated, Salt Lake City, UT, UNITED STATES, 84108 (U.S. corporation)
PI US 2003036163 A1 20030220

AI US 2002-195142 A1 20020710 (10)
PRAI US 2001-304323P 20010710 (60)
DT Utility
FS APPLICATION
LREP MYRIAD GENETICS INC., LEGAL DEPARTMENT, 320 WAKARA WAY, SALT LAKE CITY, UT, 84108
CLMN Number of Claims: 30
ECL Exemplary Claim: 1
DRWN 1 Drawing Page(s)
LN.CNT 5944
CAS INDEXING IS AVAILABLE FOR THIS PATENT.
AB Novel PN9826 protein and nucleic acids encoding PN9826 are provided. PN9826-containing protein complexes formed by PN9826 and a PN9826-interacting protein (e.g., LTBP1) are also provided. LTBP1 and PN9826 may be involved in common biological processes such as angiogenesis, metastasis, and cell growth and adhesion. Thus, the protein complexes as well as PN9826 can be used in screening assays to select modulators of PN9826 and the protein complexes formed by PN9826 and LTBP1. The identified modulators can be useful in modulating the functions and activities of PN9826 and protein complexes containing PN9826.

L7 ANSWER 26 OF 37 USPATFULL on STN
AN 2003:30383 USPATFULL
TI APOA2-interacting proteins and use thereof
IN Bartel, Paul, Salt Lake City, UT, UNITED STATES
Sugiyama, Janice, Salt Lake City, UT, UNITED STATES
PA Myriad Genetics, Incorporated, Salt Lake City, UT (U.S. corporation)
PI US 2003022330 A1 20030130
AI US 2002-125639 A1 20020418 (10)
PRAI US 2001-285324P 20010419 (60)
US 2002-349843P 20020117 (60)
DT Utility
FS APPLICATION
LREP MYRIAD GENETICS INC., LEGAL DEPARTMENT, 320 WAKARA WAY, SALT LAKE CITY, UT, 84108
CLMN Number of Claims: 38
ECL Exemplary Claim: 1
DRWN No Drawings
LN.CNT 4780
CAS INDEXING IS AVAILABLE FOR THIS PATENT.
AB Protein complexes are provided comprising APOA2 and one or more APOA2-interacting proteins. The protein complexes are useful in screening assays for identifying compounds effective in modulating the protein complexes and in treating and/or preventing diseases and disorders associated with APOA2 and its interacting partners. In addition, methods of detecting the protein complexes and modulating the functions and activities of the protein complexes or interacting members thereof are also provided.

L7 ANSWER 27 OF 37 USPATFULL on STN
AN 2003:10678 USPATFULL
TI APOA1-interacting proteins and use thereof
IN Bartel, Paul, Salt Lake City, UT, UNITED STATES
Szankasi, Philippe, Salt Lake City, UT, UNITED STATES
Sugiyama, Janice, Salt Lake City, UT, UNITED STATES
PA Myriad Genetics, Incorporated, Salt Lake City, UT (U.S. corporation)
PI US 2003008373 A1 20030109
AI US 2002-124767 A1 20020417 (10)
PRAI US 2001-284220P 20010417 (60)
US 2002-354899P 20020206 (60)
DT Utility
FS APPLICATION
LREP MYRIAD GENETICS INC., LEGAL DEPARTMENT, 320 WAKARA WAY, SALT LAKE CITY, UT, 84108
CLMN Number of Claims: 38
ECL Exemplary Claim: 1
DRWN No Drawings

LN.CNT 4667
CAS INDEXING IS AVAILABLE FOR THIS PATENT.
AB Protein complexes are provided comprising APOA1 and one or more APOA1-interacting proteins. The protein complexes are useful in screening assays for identifying compounds effective in modulating the protein complexes and in treating and/or preventing diseases and disorders associated with APOA1 and its interacting partners. In addition, methods of detecting the protein complexes and modulating the functions and activities of the protein complexes or interacting members thereof are also provided.

L7 ANSWER 28 OF 37 USPATFULL on STN
AN 2003:10629 USPATFULL
TI Caspase-7-interacting protein and use thereof
IN Bartel, Paul, Salt Lake City, UT, UNITED STATES
PA Myriad Genetics, Incorporated, Salt Lake City, UT (U.S. corporation)
PI US 2003008324 A1 20030109
AI US 2002-124550 A1 20020417 (10)
PRAI US 2001-284404P 20010417 (60)
DT Utility
FS APPLICATION
LREP MYRIAD GENETICS INC., LEGAL DEPARTMENT, 320 WAKARA WAY, SALT LAKE CITY, UT, 84108
CLMN Number of Claims: 38
ECL Exemplary Claim: 1
DRWN No Drawings
LN.CNT 4771
CAS INDEXING IS AVAILABLE FOR THIS PATENT.
AB Protein complexes are provided comprising Caspase-7 and a Caspase-7-interacting protein. The protein complexes are useful in screening assays for identifying compounds effective in modulating the protein complexes and in treating and/or preventing diseases and disorders associated with Caspase-7 and the Caspase-7-interacting protein. In addition, methods for detecting the protein complexes and modulating the functions and activities of the protein complexes or interacting members thereof are also provided.

L7 ANSWER 29 OF 37 USPATFULL on STN
AN 2002:343965 USPATFULL
TI FLT4-interacting proteins and use thereof
IN Sugiyama, Janice, Salt Lake City, UT, UNITED STATES
PA Myriad Genetics, Incorporated, Salt Lake City, UT, UNITED STATES (U.S. corporation)
PI US 2002197691 A1 20021226
AI US 2002-135802 A1 20020429 (10)
PRAI US 2001-287513P 20010430 (60)
DT Utility
FS APPLICATION
LREP MYRIAD GENETICS INC., LEGAL DEPARTMENT, 320 WAKARA WAY, SALT LAKE CITY, UT, 84108
CLMN Number of Claims: 38
ECL Exemplary Claim: 1
DRWN No Drawings
LN.CNT 4778
CAS INDEXING IS AVAILABLE FOR THIS PATENT.
AB Protein complexes are provided comprising FLT4 and one or more FLT4-interacting proteins. The protein complexes are useful in screening assays for identifying compounds effective in modulating the protein complexes and in treating and/or preventing diseases and disorders associated with FLT4 and its interacting partners. In addition, methods of detecting the protein complexes and modulating the functions and activities of the protein complexes or interacting members thereof are also provided.

L7 ANSWER 30 OF 37 USPATFULL on STN
AN 2002:340817 USPATFULL
TI Sonodynamic therapy using an ultrasound sensitizer compound
IN Alfheim, Jan Alan, Hagan, NORWAY

Henrichs, Paul Mark, Houston, TX, United States
Hohenschuh, Eric Paul, Berwyn, PA, United States
Johannesen, Edvin Wilheim, Oslo, NORWAY
Sanderson, William Anthony, late of Wayne, PA, United States deceased
Audrey W. Sanderson, United States executor
Snow, Robert Allen, West Chester, PA, United States
PA Amersham Health AS, Oslo, NORWAY (non-U.S. corporation)
PI US 6498945 B1 20021224
AI US 1999-435616 19991108 (9)
RLI Continuation of Ser. No. WO 1998-GB1444, filed on 19 May 1998
PRAI GB 1997-10049 19970519
US 1997-48487P 19970603 (60)
DT Utility
FS GRANTED
EXNAM Primary Examiner: Shaw, Shawna J.
LREP Bacon & Thomas
CLMN Number of Claims: 14
ECL Exemplary Claim: 1
DRWN 3 Drawing Figure(s); 3 Drawing Page(s)
LN.CNT 4412
CAS INDEXING IS AVAILABLE FOR THIS PATENT.
AB A method of treatment of a human or animal body by sonodynamic therapy in which a sensitizer agent is administered to the body and the body is exposed to ultrasound to achieve a cytopathogenic effect at a site therein, wherein the said sensitizer agent is a physiologically tolerable substance which is capable of enhancing the cytopathogenic efficacy of said sonodynamic therapy. Preferably, the sensitizer agent is a water-soluble **polymer** compound or a conjugate thereof.

L7 ANSWER 31 OF 37 USPATFULL on STN
AN 2002:338298 USPATFULL
TI Long wave fluorophore sensor compounds and other fluorescent sensor compounds in **polymers**
IN Walsh, Joseph C., Los Angeles, CA, UNITED STATES
Heiss, Aaron M., Orange, OH, UNITED STATES
Noronha, Glenn, Oceanside, CA, UNITED STATES
Vachon, David J., Granada Hills, CA, UNITED STATES
Lane, Stephen M., Oakland, CA, UNITED STATES
Satcher, Joe H., JR., Patterson, CA, UNITED STATES
Peyser, Thomas A., Menlo Park, CA, UNITED STATES
Van Antwerp, William Peter, Valencia, CA, UNITED STATES
Mastrototaro, John Joseph, Los Angeles, CA, UNITED STATES
PI US 2002193672 A1 20021219
US 6766183 B2 20040720
AI US 2001-33240 A1 20011228 (10)
RLI Continuation-in-part of Ser. No. US 1999-461627, filed on 14 Dec 1999, PENDING Continuation of Ser. No. US 1996-749366, filed on 21 Nov 1996, GRANTED, Pat. No. US 6002954
PRAI US 1995-7515P 19951122 (60)
US 2001-336317P 20011101 (60)
DT Utility
FS APPLICATION
LREP GATES & COOPER LLP, HOWARD HUGHES CENTER, 6701 CENTER DRIVE WEST, SUITE 1050, LOS ANGELES, CA, 90045
CLMN Number of Claims: 46
ECL Exemplary Claim: 1
DRWN 42 Drawing Page(s)
LN.CNT 1767
CAS INDEXING IS AVAILABLE FOR THIS PATENT.
AB Fluorescent biosensor molecules, fluorescent biosensors and systems, as well as methods of making and using these biosensor molecules and systems are described. Embodiments of these biosensor molecules exhibit fluorescence emission at wavelengths greater than about 650 nm. Typical biosensor molecules include a fluorophore that includes an iminium ion, a **linker** moiety that includes a group that is an anilinic type of relationship to the fluorophore and a boronate substrate recognition/binding moiety, which binds glucose. The fluorescence molecules modulated by the presence or absence of polyhydroxylated

analytes such as glucose. This property of these molecules of the invention, as well as their ability to emit fluorescent light at greater than about 650 nm, renders these biosensor molecules particularly well-suited for detecting and measuring in-vivo glucose concentrations.

L7 ANSWER 32 OF 37 USPATFULL on STN
AN 2002:315203 USPATFULL
TI BCL-XL-interacting protein and use thereof
IN Bartel, Paul, Salt Lake City, UT, UNITED STATES
PA Myriad Genetics, Incorporated, Salt Lake City, UT, UNITED STATES, 84108 (U.S. corporation)
PI US 2002177692 A1 20021128
AI US 2002-122573 A1 20020415 (10)
PRAI US 2001-284095P 20010416 (60)
DT Utility
FS APPLICATION
LREP MYRIAD GENETICS INC., LEGAL DEPARTMENT, 320 WAKARA WAY, SALT LAKE CITY, UT, 84108
CLMN Number of Claims: 38
ECL Exemplary Claim: 1
DRWN No Drawings
LN.CNT 4757
CAS INDEXING IS AVAILABLE FOR THIS PATENT.
AB Protein complexes are provided comprising BCL-XL and TCTP. The protein complexes are useful in screening assays for identifying compounds effective in modulating the protein complexes and in treating and/or preventing diseases and disorders associated with BCL-XL and TCTP. In addition, methods for detecting the protein complexes and modulating the functions and activities of the protein complexes or interacting members thereof are also provided.

L7 ANSWER 33 OF 37 USPATFULL on STN
AN 2002:314730 USPATFULL
TI Tsg101-interacting proteins and use thereof
IN Sugiyama, Janice, Salt Lake City, UT, UNITED STATES
Cimbora, Daniel, Salt Lake City, UT, UNITED STATES
PA Myriad Genetics, Incorporated, Salt Lake City, UT, UNITED STATES, 84108 (U.S. corporation)
PI US 2002177207 A1 20021128
AI US 2002-98979 A1 20020314 (10)
PRAI US 2001-276259P 20010314 (60)
US 2001-304101P 20010710 (60)
DT Utility
FS APPLICATION
LREP MYRIAD GENETICS INC., LEGAL DEPARTMENT, 320 WAKARA WAY, SALT LAKE CITY, UT, 84108
CLMN Number of Claims: 38
ECL Exemplary Claim: 1
DRWN No Drawings
LN.CNT 7034
CAS INDEXING IS AVAILABLE FOR THIS PATENT.
AB Protein complexes are provided comprising Tsg101 and one or more protein interactors of Tsg101. The protein complexes are useful in screening assays for identifying compounds effective in modulating the protein complexes and in treating and/or preventing diseases and disorders associated with Tsg101 and its interacting partner proteins. In addition, methods of detecting the protein complexes and modulating the functions and activities of the protein complexes or interacting members thereof are also provided.

L7 ANSWER 34 OF 37 USPATFULL on STN
AN 2002:314675 USPATFULL
TI COX 1-interacting proteins and use thereof
IN Wettstein, Daniel Albert, Salt Lake City, UT, UNITED STATES
PA Myriad Genetics, Incorporated, Salt Lake City, UT (U.S. corporation)
PI US 2002177152 A1 20021128
AI US 2002-100503 A1 20020318 (10)
PRAI US 2001-277013P 20010319 (60)

DT Utility
FS APPLICATION
LREP MYRIAD GENETICS INC., LEGAL DEPARTMENT, 320 WAKARA WAY, SALT LAKE CITY, UT, 84108
CLMN Number of Claims: 38
ECL Exemplary Claim: 1
DRWN No Drawings
LN.CNT 4721
CAS INDEXING IS AVAILABLE FOR THIS PATENT.
AB Protein complexes are provided comprising COX1 and one or more proteins selected from the group consisting of THR S14 and Opa1. The protein complexes are useful in screening assays for identifying compounds effective in modulating the protein complexes and in treating and/or preventing diseases and disorders associated with COX1 and its interacting partner proteins. In addition, methods of detecting the protein complexes and modulating the functions and activities of the protein complexes or interacting members thereof are also provided.

L7 ANSWER 35 OF 37 USPATFULL on STN
AN 2002:307902 USPATFULL
TI Survivin-interacting proteins and use thereof
IN Wettstein, Daniel Albert, Salt Lake City, UT, UNITED STATES
Cimbora, Daniel, Salt Lake City, UT, UNITED STATES
PA Myriad Genetics, Incorporated, Salt Lake City, UT (U.S. corporation)
PI US 2002173026 A1 20021121
AI US 2002-99924 A1 20020314 (10)
PRAI US 2001-276179P 20010315 (60)
US 2001-307233P 20010723 (60)
DT Utility
FS APPLICATION
LREP MYRIAD GENETICS INC., LEGAL DEPARTMENT, 320 WAKARA WAY, SALT LAKE CITY, UT, 84108
CLMN Number of Claims: 38
ECL Exemplary Claim: 1
DRWN No Drawings
LN.CNT 5137
CAS INDEXING IS AVAILABLE FOR THIS PATENT.
AB Protein complexes are provided comprising survivin and one or more proteins selected from the group consisting of HDLC1, beta-actin, DNA helicase II, COPP, OSTP, SLC8A1, A2-CAT. The protein complexes are useful in screening assays for identifying compounds effective in modulating the protein complexes and in treating and/or preventing diseases and disorders associated with survivin and its interacting partner proteins. In addition, methods of detecting the protein complexes and modulating the functions and activities of the protein complexes or interacting members thereof are also provided.

L7 ANSWER 36 OF 37 USPATFULL on STN
AN 2002:192442 USPATFULL
TI Optically-active nanoparticles for use in therapeutic and diagnostic methods
IN West, Jennifer L., Pearland, TX, UNITED STATES
Halas, Nancy J., Houston, TX, UNITED STATES
Hirsch, Leon R., Houston, TX, UNITED STATES
PI US 2002103517 A1 20020801
US 6530944 B2 20030311
AI US 2001-779677 A1 20010208 (9)
PRAI US 2000-181109P 20000208 (60)
US 2000-222437P 20000801 (60)
DT Utility
FS APPLICATION
LREP FULBRIGHT & JAWORSKI L.L.P., Gino Catena, Suite 5100, 1301 McKinney, Houston, TX, 77010-3095
CLMN Number of Claims: 39
ECL Exemplary Claim: 1
DRWN 9 Drawing Page(s)
LN.CNT 2113
CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB This invention is generally in the field of improved methods for the localized delivery of heat and the localized imaging of biological materials. The delivery may be in vitro or in vivo and is useful for the localized treatment of cancer, inflammation or other disorders involving overproliferation of tissue. The method is also useful for diagnostic imaging. The method involves localized induction of hyperthermia in a cell or tissue by delivering nanoparticles to said cell or tissue and exposing the nanoparticles to an excitation source under conditions wherein they emit heat.

L7 ANSWER 37 OF 37 USPATFULL on STN
AN 2002:78245 USPATFULL
TI Novel targeted delivery systems for bioactive agents
IN Unger, Evan C., Tucson, AZ, UNITED STATES
Matsunaga, Terry Onichi, Tucson, AZ, UNITED STATES
Ramaswami, Varadarajan, Tucson, AZ, UNITED STATES
Romanowski, Marek J., Tucson, AZ, UNITED STATES
PI US 2002041898 A1 20020411
AI US 2001-912609 A1 20010725 (9)
RLI Continuation-in-part of Ser. No. US 2000-703474, filed on 31 Oct 2000, PENDING Continuation-in-part of Ser. No. US 2000-478124, filed on 5 Jan 2000, PENDING
DT Utility
FS APPLICATION
LREP David A. Cherry, Esq., WOODCOCK WASHBURN KURTZ, MACKIEWICZ & NORRIS LLP, One Liberty Place - 46th Floor, Philadelphia, PA, 19103
CLMN Number of Claims: 100
ECL Exemplary Claim: 1
DRWN 5 Drawing Page(s)
LN.CNT 3658
CAS INDEXING IS AVAILABLE FOR THIS PATENT.
AB Novel targeted delivery systems for bioactive agents. In preferred form, the delivery systems comprise, in combination with an effective amount of a bioactive agent, a targeted matrix comprising a **polymer** and a targeting ligand. Preferably, the targeting ligand is covalently associated with the **polymer** and the bioactive agent is associated non-covalently with the **polymer**. Also in preferred embodiments, the bioactive agent is substantially homogeneously dispersed throughout the matrix. The compositions are particularly suitable as delivery vehicles with bioactive agents that have limited water solubility.

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FILE COVERS 1971 TO PATENT PUBLICATION DATE: 5 Apr 2005 (20050405/PD)
FILE LAST UPDATED: 5 Apr 2005 (20050405/ED)
HIGHEST GRANTED PATENT NUMBER: US6877166
HIGHEST APPLICATION PUBLICATION NUMBER: US2005071904
CA INDEXING IS CURRENT THROUGH 5 Apr 2005 (20050405/UPCA)
ISSUE CLASS FIELDS (/INCL) CURRENT THROUGH: 5 Apr 2005 (20050405/PD)
REVISED CLASS FIELDS (/NCL) LAST RELOADED: Feb 2005
USPTO MANUAL OF CLASSIFICATIONS THESAURUS ISSUE DATE: Feb 2005

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>>> /PK, etc. <<<

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substance identification.

=> s dendrimer?/clm
L8          684 DENDRIMER?/CLM

=> s l8 and polyethylene/clm
         68420 POLYETHYLENE/CLM
L9           88 L8 AND POLYETHYLENE/CLM

=> s l9 and terminal/clm
        212311 TERMINAL/CLM
L10          19 L9 AND TERMINAL/CLM

=> d bib ab clm 1-
YOU HAVE REQUESTED DATA FROM 19 ANSWERS - CONTINUE? Y/(N):y

L10  ANSWER 1 OF 19  USPATFULL on STN
AN     2005:31627  USPATFULL
TI     Charge-dynamic polymers and delivery of anionic compounds
IN     Lynn, David M., Middleton, WI, UNITED STATES
       Miller, Adam D., Berkeley, CA, UNITED STATES
PA     Wisconsin Alumni Research Foundation (U.S. corporation)
PI     US 2005027064      A1   20050203
AI     US 2004-886161     A1   20040707 (10)
PRAI   US 2003-486107P     20030709 (60)
DT     Utility
FS     APPLICATION
LREP   FOLEY & LARDNER, 150 EAST GILMAN STREET, P.O. BOX 1497, MADISON, WI,
       53701-1497
CLMN   Number of Claims: 57
ECL    Exemplary Claim: 1
DRWN   11 Drawing Page(s)
LN.CNT 2029
CAS INDEXING IS AVAILABLE FOR THIS PATENT.
AB     The present invention provides dynamic charge state cationic polymers
       that are useful for delivery of anionic molecules. The dynamic charge
       state cationic polymers are designed to have cationic charge densities
       that decrease by removal of removable functional groups from the
       polymers. The present invention also provides interpolyelectrolyte
       complexes containing the polymers complexed to a polyanion. Methods for
       using the interpolyelectrolyte complexes to deliver anionic compounds
       are also provided.
CLM    What is claimed is:
       1. A composition, comprising a dynamic charge state cationic polymer,
       the dynamic charge state cationic polymer comprising a polymeric
       backbone formed from monomeric units, and one or more removable
       functional group attached to the polymeric backbone, wherein the dynamic
       charge state cationic polymer has a cationic charge density and further
       wherein the cationic charge density of the dynamic charge state cationic
       polymer decreases when one or more of the one or removable functional
       group is removed from the dynamic charge state cationic polymer.

       2. The composition of claim 1, wherein the polymeric backbone comprises
       a polyamine, acrylate or methacrylate polymer.

       3. The composition of claim 1, wherein the polymeric backbone comprises
       polyethyleneimine, poly(propylene imine), poly(allyl amine), poly(vinyl
       amine), poly(amidoamine), or a dendrimer that is
       functionalized with terminal amine groups.
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4. The composition of claim 1, wherein the polymer is linear, branched or hyperbranched.

5. The composition of claim 1, wherein at least one of the one or more removable functional group is a hydrolyzable group.

6. The composition of claim 5, wherein the hydrolyzable group is a pendant ester group.

7. The composition of claim 1, wherein the one or more removable functional group comprises a labile linkage selected from an ester, an anhydride, an orthoester, a phosphoester, an acetal, or an amide.

8. The composition of claim 1, wherein the polymeric backbone comprises the formula: ##STR6## wherein n is an integer ranging from 5 to 100,000, x is an integer, y is an integer, wherein the mole percent of y ranges from 10 percent to 100 percent based on the total amount of x and y, and R is selected from an alkyl, alkenyl, alkynyl, cycloalkyl, heterocyclic, aryl, or heteroaryl group.

9. The composition of claim 1, wherein one or more of the one or more removable functional group comprises a primary, secondary or a tertiary amine.

10. The composition of claim 8, wherein R is selected from methyl, ethyl, propyl, butyl, pentyl, or hexyl groups or combinations thereof.

11. The composition of claim 1, wherein the mole percent of the monomeric units of the polymeric backbone substituted with the one or more removable functional group ranges from about 10 percent to about 100 percent.

12. The composition of claim 1, wherein the molecular weight of the dynamic charge state cationic polymer ranges from 1,000 or about 1,000 to 100,000 or about 100,000 grams/mole.

13. The composition of claim 1, wherein the dynamic charge state cationic polymer is associated with a ligand.

14. The composition of claim 13, wherein the ligand is specific for a target cell.

15. The composition of claim 13, wherein the ligand is an antibody or fragment thereof.

16. The composition of claim 1, wherein the dynamic charge state cationic polymer is zwitterionic.

17. The composition of claim 1, wherein the dynamic charge state cationic polymer is capable of buffering changes in pH.

18. The composition of claim 1, wherein the polymeric backbone is positively charged.

19. The composition of claim 1, wherein the dynamic charge state cationic polymer is non-immunogenic, non-toxic or both.

20. The composition of claim 1, wherein the dynamic charge state cationic polymer is contained in a biologically compatible solution.

21. The composition of claim 1, wherein the dynamic charge state cationic polymer is contained in a biological solution.

22. The composition of claim 1, further comprising a pharmaceutically acceptable excipient.

23. The composition of claim 1, wherein the polymeric backbone is

neutral.

24. The composition of claim 1, wherein at least one of the one or more removable functional group is positively charged.

25. The composition of claim 1, wherein the polymeric backbone is degradable at physiologic pH.

26. The composition of claim 1, wherein the polymeric backbone comprises a copolymer.

27. The composition of claim 26, wherein one or more segment of the copolymer comprises the one or more removable functional group, and one or more segment of the copolymer do not comprise the one or more removable functional group.

28. The composition of claim 26, wherein one segment of the copolymer comprises **polyethylene** glycol or **polyethylene** oxide.

29. The composition of claim 1, wherein the dynamic charge state cationic polymer is complexed to one or more anion thereby forming an interpolyelectrolyte complex.

30. The composition of claim 29, wherein the one or more anion comprises a nucleic acid.

31. The composition of claim 30, wherein the nucleic acid comprises RNA or DNA.

32. The composition of claim 30, wherein the nucleic acid has the sequence of a nucleic acid molecule of interest or its complement.

33. The composition of claims 30, wherein the nucleic acid encodes a protein or a functional fragment thereof.

34. The composition of claim 30, wherein the nucleic acid is a plasmid.

35. The composition of claim 29, wherein the one or more anion comprises a therapeutic molecule, a diagnostic molecule, a peptide, or a carbohydrate.

36. The composition of claim 35, wherein the carbohydrate is a macromolecular carbohydrate.

37. The composition of claim 36, wherein the macromolecular carbohydrate is heparin.

38. The composition of claim 29, wherein the one or more anion comprise a small molecule.

39. The composition of claim 29, wherein the interpolyelectrolyte complex is from about 50 nm to about 400 nm in size.

40. The composition of claim 29, wherein the interpolyelectrolyte complex is encapsulated in a liposome.

41. The composition of claim 29, wherein the interpolyelectrolyte complex comprises one or more layers of the dynamic charge state cationic polymer and one or more layers of the one or more anion.

42. A method for delivering an anionic compound to a target cell, comprising: contacting a composition comprising the interpolyelectrolyte complex of claim 29 with the target cell thereby allowing the target cell to uptake the composition, wherein when the interpolyelectrolyte complex enters the target cell, at least one or more of the removable functional groups is removed from the dynamic charge state cationic polymer which decreases the cationic charge density of the dynamic charge state cationic polymer thereby promoting dissociation of the

interpolyelectrolyte complex into the dynamic charge state cationic polymer and the one or more anion.

43. The method of claim 42, wherein the at least one of the one or more of the removable functional groups is removed from the dynamic charge state cationic polymer in a nucleus of the target cell.

44. The method of claim 42, wherein the at least one of the one or more of the removable functional groups is removed from the dynamic charge state cationic polymer in an endosome of the target cell.

45. The method of claim 42, wherein the at least one of the one or more of the removable functional groups is removed from the dynamic charge state cationic polymer in a cytosol of the target cell.

46. The method of claim 42, further comprising mixing the dynamic charge state cationic polymer with the one or more anion to form the interpolyelectrolyte complex.

47. The method of claims 42, wherein the one or more anion comprises DNA, and the DNA is stably incorporated into the genome of the target cell.

48. The method of claim 42, further comprising administering the interpolyelectrolyte complex to a mammal.

49. The method of claim 42, wherein the interpolyelectrolyte complex is contacted with the target cell in vivo.

50. The method of claim 42, wherein the interpolyelectrolyte complex is contacted with the target cell in vitro.

51. The method of claim 42, wherein the target cell is a eukaryotic cell.

52. The method of claim 42, wherein the removal of the at least one or more of the removable functional groups from the dynamic charge state cationic polymer is at least partially hydrolytic.

53. The method of claim 42, wherein the removal of the at least one or more of the removable functional groups from the dynamic charge state cationic polymer is at least partially enzymatic.

54. The method of claim 42, wherein the removal of the at least one or more of the removable functional groups from the dynamic charge state cationic polymer is at least partially photolytic.

55. The method of claim 42, wherein the removal of the at least one or more of the removable functional groups from the dynamic charge state cationic polymer occurs at a substantially constant rate.

56. The method of claim 42, wherein the removal of the at least one or more of the removable functional groups from the dynamic charge state cationic polymer does not occur at a constant rate.

57. A kit for delivering an anionic compound to a cell, the kit comprising the composition of claim 1, and instructions for using the composition to deliver one or more anion to the cell.

L10 ANSWER 2 OF 19 USPATFULL on STN
AN 2005:23379 USPATFULL
TI Dendrimers for use in targeted delivery
IN Uchegbu, Ijeoma, Glasgow, UNITED KINGDOM
Munro, Avril, Fife, UNITED KINGDOM
Schatzlein, Andreas Gerhart, Glasgow, UNITED KINGDOM
Gray, Alexander Irvine, Glasgow, UNITED KINGDOM
Zinselmeyer, Bernd, Delbrueck, GERMANY, FEDERAL REPUBLIC OF

PI US 2005019923 A1 20050127
AI US 2004-493125 A1 20040907 (10)
WO 2002-GB4706 20021017
PRAI GB 2001-25216 20011019
DT Utility
FS APPLICATION
LREP MYERS BIGEL SIBLEY & SAJOVEC, PO BOX 37428, RALEIGH, NC, 27627
CLMN Number of Claims: 25
ECL Exemplary Claim: CLM-01-33
DRWN 7 Drawing Page(s)
LN.CNT 1049
CAS INDEXING IS AVAILABLE FOR THIS PATENT.
AB The present invention provides cationic dendrimers for delivering bioactive molecules, such as polynucleotide molecules, peptides and polypeptides and/or pharmaceutical agents, to a mammalian body. The dendrimers disclosed herein are suitable for targeting the delivery of the bioactive molecules to, for example, the liver, spleen, lung, kidney or heart.
CLM What is claimed is:
1-33. (canceled).

34. A composition for the delivery of a bioactive molecule to a target location in the body of a recipient, said composition comprising a cationic polypropylenimine **dendrimer** comprising a diaminobutane core with 1, 2, or 3 generations of propylenimine molecules attached, admixed with the bioactive molecule.

35. The composition according to claim 34, wherein the cationic **dendrimers** are modified by covalently binding derivatising groups.

36. The composition according to claim 35, wherein the cationic **dendrimers** are derivatised using groups selected from the group consisting of hydrophobic, hydrophilic and amphiphilic groups.

37. The composition according to claim 35, wherein the cationic **dendrimers** are derivatised by binding two **dendrimer** molecules to either end of a hydrocarbon chain.

38. The composition according to claim 37, wherein the length of the hydrocarbon chain is selected from the group consisting of 8, 12, 14, 16 and 18 carbons.

39. The composition according to claim 37, wherein the derivatised cationic **dendrimer** is a bolamphiphilic **dendrimer**.

40. The composition according to claim 39, wherein the number of derivatising groups is from one derivatising group per **dendrimer** molecule up to and including derivatising all available surface or **terminal** groups on the **dendrimer** molecule.

41. The composition according to claim 36, wherein the amphiphilic derivative comprises a hydrophilic and a hydrophobic segment.

42. The composition according to claim 41, wherein the hydrophilic segment is derived from a phosphoglycerate molecule.

43. The composition according to claim 41, wherein the hydrophobic segment is covalently bound to the hydrophilic segment via an ester linkage.

44. The composition according to claim 41, wherein the hydrophobic segment is selected from the group consisting of alkyl, alkenyl and alkynyl groups of from 8 to 24 carbons in length.

45. The composition according to claim 41, wherein the amphiphilic derivative is attached to the **dendrimer** by a linker molecule selected from the group consisting of **polyethylene** glycol

(PEG) and a sugar molecule.

46. The composition according to claim 45, wherein the length of the PEG linker molecule is from 1 to 120 ethylene glycol units.

47. The composition according to claim 45, wherein the linker molecule is a phosphoglyceride.

48. The composition according to claim 41, wherein the number of amphiphilic derivatives per **dendrimer** molecule is from 1 derivatising group per **dendrimer** molecule to derivatising all of the groups of the **dendrimer**.

49. The composition according to claim 34, wherein the bioactive molecule is selected from the group consisting of polynucleotides, peptides, polypeptides and pharmaceutically active agents.

50. In a method of transfecting mammalian cells in vitro with a composition, the improvement comprising transfecting said cells in vitro with a composition according to claim 34.

51. A pharmaceutical formulation comprising the composition of claim 34 and a pharmaceutically acceptable carrier.

52. A method of delivering a bioactive molecule to a target location in the body of a recipient, comprising administering the composition of claim 34 to said recipient.

53. The method according to claim 52, wherein the target location is selected from the group consisting of the liver, spleen, lung, kidney and heart.

54. The method according to claim 52, wherein the composition is for the delivery of a bioactive molecule to the liver of the recipient, and wherein said composition comprises the polypropylenimine **dendrimer** DAB16 admixed with said bioactive molecule.

55. The method according to claim 52, wherein the composition is for the delivery of a bioactive molecule to the spleen of the recipient, and wherein said composition comprises the polypropylenimine **dendrimer** DSAM16 admixed with said bioactive molecule.

56. The method according to claim 52, wherein the recipient is a human.

57. A method of preparing the composition of claim 34, comprising admixing a polypropropylenimine **dendrimer** comprising a diammobutane core with 1, 2 or 3 generations of propylenimine molecules attached, and/or derivatives thereof, and at least one bioactive molecule.

L10 ANSWER 3 OF 19 USPATFULL on STN
AN 2004:334662 USPATFULL
TI Photoactive materials
IN Marck, Guy, Schlierbach, FRANCE
Seiberle, Hubert, Weil am Rhein, GERMANY, FEDERAL REPUBLIC OF
Ibn-Elhaj, Mohammed, Allschwil, SWITZERLAND
PI US 2004265742 A1 20041230
AI US 2004-484260 A1 20040709 (10)
WO 2002-CH391 20020715
PRAI EP 2001-810709 20010717
DT Utility
FS APPLICATION
LREP SUGHRUE MION, PLLC, 2100 PENNSYLVANIA AVENUE, N.W., SUITE 800, WASHINGTON, DC, 20037
CLMN Number of Claims: 63
ECL Exemplary Claim: 1
DRWN No Drawings

LN.CNT 1890
CAS INDEXING IS AVAILABLE FOR THIS PATENT.
AB Photoreactive dendrimers comprising a core portion, branching units and terminal groups, wherein at least one terminal group and/or branching unit is a photoreactive group and wherein the photo reactive groups include preferably cinnamates, coumarins, benzylidenephthalimidines, benzylideneacetophenones, diphenylacetylenes stilbazoles, uracyl, quinolinone, maleinimides, or cinnamylidene acetic acid derivatives and are able to undergo photocyclization, in particular [2+2]-photocyclization.

CLM What is claimed is:

1. Photoreactive **dendrimers** comprising a core portion, branching units and **terminal** groups, wherein at least one **terminal** group and/or branching unit is a photoreactive group.

2. Photoreactive **dendrimers** according to claim 1, wherein the photoreactive groups are able to undergo photocyclization, in particular [2+2]-photocyclization.

3. Photoreactive **dendrimers** according to claim 1, wherein the photoreactive groups are sensitive to UV or laser light, in particular linearly polarized UV light.

4. Photoreactive **dendrimers** according to claim 1, wherein the photoreactive groups are cinnamates, coumarins, benzylidenephthalimidines, benzylideneacetophenones, diphenylacetylenes stilbazoles, uracyl, quinolinone, maleinimides, or cinnamylidene acetic acid derivatives.

5. Photoreactive **dendrimers** according to claim 4, wherein the photoreactive groups are cinnamates, coumarins, benzylideneacetophenones, or maleinimides.

6. Photoreactive **dendrimers** according to claim 4, wherein the photoreactive groups are cinnamates or coumarins.

7. Photoreactive **dendrimers** according to claim 1, wherein the photoreactive groups are represented by the general formulae Ia and Ib: ##STR9## wherein the broken line indicates the point of linkage to the outermost generation of the **dendrimer** and A represents pyrimidine-2,5-diyl, pyridine-2,5-diyl, 2,5-thiophenylene, 2,5-furanylene, 1,4- or 2,6-naphthylene; or phenylene, which is unsubstituted or mono- or poly-substituted by fluorine, chlorine or by a cyclic, straight-chain or branched alkyl residue which is unsubstituted mono- or poly-substituted by fluorine, chlorine, having 1 to 18 carbon atoms, wherein one or more non-adjacent --CH.sub.2-- groups may independently be replaced by a group C; wherein C represents a group selected from --O--, --CO--, --CO--O--, --O--CO--, --NR.sup.1--, --NR.sup.1--CO--, --CO--NR.sup.1--, --NR.sup.1--CO--O--, --O--CO--NR.sup.1--, --NR.sup.1--CO--NR.sup.1--, --CH.dbd.CH--, --C.dbd.C--, --O--CO--O-- and --Si(CH.sub.3).sub.2--O--Si(CH.sub.3).sub.2--, wherein R.sup.1 represents hydrogen or lower alkyl; B represents hydrogen, or a group which is able to react or interact with a second material like polymers, oligomers, monomers, photoactive polymers, photoactive oligomers and/or photoactive monomers or surfaces; S.sub.1 and S.sub.2 each independently of the other represent a single bond or a spacer unit such as a straight-chain or branched alkylene group which is unsubstituted, mono or poly-substituted by fluorine, chlorine, having 1 to 40 carbon atoms, wherein one or more non-adjacent --CH.sub.2-- groups may independently be replaced by a group D, with the proviso that oxygen atoms are not directly attached to each other; wherein D represents a group selected from --O--, --CO--, --CO--O--, --O--CO--, --NR.sup.1--, --NR.sup.1--CO--, --CO--NR.sup.1--, --NR.sup.1--CO--O--, --O--CO--NR.sup.1--, --NR.sup.1--CO--NR.sup.1--, --CH.dbd.CH--, --C.tbd.C--, --O--CO--O-- and --Si(CH.sub.3).sub.2--O--Si(CH.sub.3).sub.2--, an aromatic or an alicyclic group, wherein R.sup.1 represents hydrogen or lower alkyl; Q represents oxygen or --NR.sup.1-- wherein R.sup.1 represents hydrogen or lower alkyl; and X, Y each

independently of the other represents hydrogen, fluorine, chlorine, cyano, alkyl optionally substituted by fluorine having 1 to 12 carbon atoms in which optionally one or more non-adjacent alkyl --CH.sub.2-- groups are replaced by --O--, --CO--O--, --O--CO-- and/or --CH.dbd.CH--.

8. Photoreactive **dendrimers** according to claim 7, wherein A is selected from pyrimidine-2,5-diyl, pyridine-2,5-diyl, 2,5-thiophenylene, 2,5-furanylene, 1,4- or 2,6-naphthylene and phenylene, which is unsubstituted or substituted by a cyclic, straight-chain or branched alkyl residue which is unsubstituted, mono- or poly-substituted by fluorine, chlorine having from 1 to 12 carbon atoms in which optionally one or more non-adjacent alkyl --CH.sub.2-- groups are replaced by --O--, --CO--, --CO--O--, --O--CO--, --CH.dbd.CH-- and C--C.tbd.C--.

9. Photoreactive **dendrimers** according to claim 8, wherein A is selected from 2,5-furanylene, 1,4- or 2,6-naphthylene and phenylene, which is unsubstituted or substituted by a cyclic, straight-chain or branched alkyl residue having 1 to 12 carbon atoms in which optionally one or more non-adjacent alkyl --CH.sub.2-- groups are replaced by --O--, --CO--, --CO--O--, --O--CO--, --CH.dbd.CH-- and --C.tbd.C--.

10. Photoreactive **dendrimers** according to 7, wherein B is a radically or cationically polymerizable group; hydrophilic anionic groups like groups consisting of --OSO.sub.2O.sup.-, --SO.sub.2O.sup.-, --CO.sub.2.sup.-, (--O).sub.2P(O)O.sup.-, --P(O)(O.sup.-).sub.2, --OP(O)(O.sup.-).sub.2, --P(O.sup.-).sub.2 and --OP(O.sup.-).sub.2 in protonated or salt form e.g. as alkali metals salts or ammonium salts; polar groups like alcohol, thiol and isocyanate; and also mono-di-tri-alkoxy or halogeno silanes.

11. Photoreactive **dendrimers** according to claim 10, wherein B is selected from hydrogen, radically or cationically polymerizable groups or mono-, di-, tri-alkoxy or halogeno silanes.

12. Photoreactive **dendrimers** according to claim 10, wherein B is selected from hydrogen or radically or cationically polymerizable groups.

13. Photoreactive **dendrimers** according to claim 10, wherein B is hydrogen.

14. Photoreactive **dendrimers** according to claim 7, wherein Q is O or --NH--.

15. Photoreactive **dendrimers** according to claim 14, wherein Q is O.

16. Photoreactive **dendrimers** according to claim 7, wherein the groups X and Y represent hydrogen.

17. Photoreactive **dendrimers** according to claim 7, wherein the photoactive groups are groups of formula Ia.

18. Photoreactive **dendrimers** according to claim 7, wherein S.sub.1 is selected from a single covalent bond, --O--, --CO--O--, --O--CO--, --NR.sup.1--, --NR.sup.1--CO--, --CO--NR.sup.1--, --NR.sup.1--CO--O--, --O--CO--NR.sup.1--, --NR.sup.1--C O--NR.sup.1--, --CH.dbd.CH--, --C.tbd.C--, --O--CO--O-- and a straight-chain or branched alkylene group, which is optionally substituted by one or more groups selected from fluorine, chlorine and cyano and in which two or three non-adjacent alkylene --CH.sub.2-- groups are independently optionally replaced by a group D with the proviso that the total number of chain carbon atoms in the alkylene group does not exceed 24, wherein R.sup.1 represents hydrogen or lower alkyl.

19. Photoreactive **dendrimers** according to claim 18, wherein S.sub.1 is selected from a single covalent bond, --CO--O--, --O--CO--, --(CH.sub.2).sub.r--, --(CH.sub.2).sub.r--O--, --(CH.sub.2).sub.r--CO--,

--(CH.sub.2).sub.r--CO--O--, --(CH.sub.2).sub.r--O--CO--,
--(CH.sub.2).sub.r--CO--NR.sup.1--, --(CH.sub.2).sub.r--NR.sup.1--CO--,
--(CH.sub.2).sub.r--NR.sup.1--, --O--(CH.sub.2).sub.r--,
--CO--O--(CH.sub.2).sub.r--, --O--CO--(CH.sub.2).sub.r--,
--NR.sup.1--CO--(CH.sub.2).sub.r--, --CO--NR.sup.1--(CH.sub.2).sub.r--,
--NR.sup.1--(CH.sub.2).sub.r--, --O--(CH.sub.2).sub.r--CO--O--,
--O--(CH.sub.2).sub.r--O--CO--, --O--(CH.sub.2).sub.r--CO--NR.sup.1--,
--O--(CH.sub.2).sub.r--NR.sup.1--, --O--(CH.sub.2).sub.r--O--,
--O--(CH.sub.2).sub.r--NR.sup.1--CO--, --NR.sup.1--(CH.sub.2).sub.r--CO--
O--, --NR.sup.1--(CH.sub.2).sub.r--O--, --NR.sup.1--(CH.sub.2).sub.r--
NR.sup.1--, --NR.sup.1--(CH.sub.2).sub.r--O--CO--, --CO--NR.sup.1--
(CH.sub.2).sub.r--O--, --CO--NR.sup.1--(CH.sub.2).sub.r--NR.sup.1--,
--CO--NR.sup.1--(CH.sub.2).sub.r--O--CO--, --O--CO--(CH.sub.2).sub.r--CO-
-, --O--CO--(CH.sub.2).sub.r--O--, --O--CO--(CH.sub.2).sub.r--NR.sup.2--
, --O--CO--(CH.sub.2).sub.r--CO--O--, --O--CO--(CH.sub.2).sub.r--CO--
NR.sup.1--, --O--CO--(CH.sub.2).sub.r--NR.sup.1--CO--,
--(CH.sub.2).sub.r--O--(CH.sub.2).sub.s--, --(CH.sub.2).sub.r--CO--O--
(CH.sub.2).sub.s--, --(CH.sub.2).sub.r--O--CO--(CH.sub.2).sub.s--,
--(CH.sub.2).sub.r--NR.sup.1--CO--(CH.sub.2).sub.s--,
--(CH.sub.2).sub.r--NR.sup.1--CO--O--(CH.sub.2).sub.s--,
--(CH.sub.2).sub.r--O--(CH.sub.2).sub.s--O--, --(CH.sub.2).sub.r--CO--O--
(CH.sub.2).sub.s--O--, --(CH.sub.2).sub.r--O--CO--(CH.sub.2).sub.s--O--,
--(CH.sub.2).sub.r--NR.sup.1--CO--(CH.sub.2).sub.s--O--,
--(CH.sub.2).sub.r--NR.sup.1--CO--O--(CH.sub.2).sub.s--O--,
--O--(CH.sub.2).sub.r--O--(CH.sub.2).sub.s--, --O--(CH.sub.2).sub.r--CO--
O--(CH.sub.2).sub.s--, --O--(CH.sub.2).sub.r--NR.sup.1--CO--
(CH.sub.2).sub.s--, --O--(CH.sub.2).sub.r--NR.sup.1--CO--O--
(CH.sub.2).sub.s--, --O--(CH.sub.2).sub.r--CO--O--(CH.sub.2).sub.s--O--,
--O--(CH.sub.2).sub.r--O--(CH.sub.2).sub.s--O--, --O--(CH.sub.2).sub.r--
NR.sup.1--CO--(CH.sub.2).sub.s--O--, --O--(CH.sub.2).sub.r--NR.sup.1--CO-
-O--(CH.sub.2).sub.s--O--, --CO--O--(CH.sub.2).sub.r--O--
(CH.sub.2).sub.s-- and --CO--O--(CH.sub.2).sub.r--O--(CH.sub.2).sub.s--O-
-, wherein R.sup.1 is as defined above, r and s each represent an
integer from 1 to 20, preferably from 1 to 12, and r+s≤21,
preferably ≤15.

20. Photoreactive **dendrimers** according to claim 18, wherein
S.sub.1 is selected from a single covalent bond, --(CH.sub.2).sub.r--,
--(CH.sub.2).sub.r--O--, --(CH.sub.2).sub.r--CO--O--,
--(CH.sub.2).sub.r--O--CO--, --(CH.sub.2).sub.r--CO--NH--,
--(CH.sub.2).sub.r--NH--CO--, --O--(CH.sub.2).sub.r--,
--CO--O--(CH.sub.2).sub.r--, --CO--NH--(CH.sub.2).sub.r--,
--O--CO--(CH.sub.2).sub.r--, --O--CO--(CH.sub.2).sub.r--CO--O--,
--O--(CH.sub.2).sub.r--O--CO--, --O(CH.sub.2).sub.r CO--NH--,
--O--(CH.sub.2).sub.r--NH--CO--, --CO--O--(CH.sub.2).sub.r--O--,|--CO--
NH--(CH.sub.2).sub.r--O--, --O--(CH.sub.2).sub.r--O--,
--(CH.sub.2).sub.r--NH--CO--(CH.sub.2).sub.s--, --(CH.sub.2).sub.r--NH--
CO--O--(CH.sub.2).sub.s--, --(CH.sub.2).sub.r--O--(CH.sub.2).sub.s--O--,
--(CH.sub.2).sub.r--NH--CO--(CH.sub.2).sub.s--O--, --(CH.sub.2).sub.r--
NH CO--O--(CH.sub.2).sub.s--O--, --O--(CH.sub.2).sub.r--NH--CO--
(CH.sub.2).sub.s--, --O--(CH.sub.2).sub.r--O--(CH.sub.2).sub.s--O--,
--O--CO--(CH.sub.2).sub.r--O--(CH.sub.2).sub.s--O--,
--CO--O--(CH.sub.2).sub.r--O--(CH.sub.2).sub.s--O--,
--O--(CH.sub.2).sub.r--NH--CO--(CH.sub.2).sub.s--O-- and
--O--CO--(CH.sub.2).sub.r--NH--CO--(CH.sub.2).sub.s--O--, wherein r and
s each represent an integer from 1 to 12 and r+s≤15.

21. Photoreactive **dendrimers** according to claim 18, wherein SI
includes 1,2-ethylene, 1,3-propylene, 1,4-butylene, 1,5-pentylene,
1,6-hexylene, 1,7-heptylene, 1,8-octylene, 1,9-nonylene, 1,10-decylene,
1,11-undecylene, 1,12-dodecylene, 3-methyl--1,4-butylene,
3-propyleneoxy, 3-propyleneoxycarbonyl, 2-ethylenecarbonyloxy,
4-butyleneoxy, 4-butyleneoxycarbonyl, 3-propylenecarbonyloxy,
5-pentyleneoxy, 5-pentyleneoxycarbonyl, 4-butylenecarbonyloxy,
6-hexyleneoxy, 6-hexyleneoxycarbonyl, 5-pentylenecarbonyloxy,
7-heptyleneoxy, 7-heptyleneoxycarbonyl, 6-hexylenecarbonyloxy,
8-octyleneoxy, 8-octyleneoxycarbonyl, 7-heptylenecarbonyloxy,
9-nonyleneoxy, 9-nonyleneoxycarbonyl, 8-octylenecarbonyloxy,

10-decyleneoxy, 10-decyleneoxycarbonyl, 9-nonylenecarbonyloxy, 11-undecyleneoxy, 11-undecyleneoxycarbonyl, 10-decylenecarbonyloxy, 12-dodecyleneoxy, 12-dodecyleneoxycarbonyl, 11-undecylenecarbonyloxy, 3-propyleneiminocarbonyl, 4-butyleneiminocarbonyl, 5-pentyleneiminocarbonyl, 6-hexyleneiminocarbonyl, 7-heptyleneiminocarbonyl, 8-octyleneiminocarbonyl, 9-nonyleneiminocarbonyl, 10-decyleneiminocarbonyl, 11-undecyleneiminocarbonyl, 12-dodecyleneiminocarbonyl, 2-ethylenecarbonylimino, 3-propylenecarbonylimino, 4-butylenecarbonylimino, 5-pentylenecarbonylimino, 6-hexylenecarbonylimino, 7-heptylenecarbonylimino, 8-octylenecarbonylimino, 9-nonylenecarbonylimino, 10-decylenecarbonylimino, 11-undecylenecarbonylimino, 6-(3-propyleneiminocarbonyloxy)hexylene, 6-(3-propyleneoxy)hexylene, 6-(3-propyleneoxy)-hexyloxy, 6-(3-propyleneiminocarbonyloxy)hexyloxy, 6-(3-propyleneiminocarbonyl)hexyl, 6-(3-propyleneiminocarbonyl)hexyloxy, 1,2-ethylenedioxy, 1,3-propylenedioxy, 1,4-butylenedioxy, 1,5-pentylenedioxy, 1,6-hexylenedioxy, 1,7-heptylenedioxy, 1,8-octylenedioxy, 1,9-nonylenedioxy, 1,10-decylenedioxy, 1,11-undecylenedioxy, 1,12-dodecylenedioxy and the like.

22. Photoreactive **dendrimers** according to claim 7, wherein S.sub.2 is selected from a single covalent bond, a straight-chain or branched alkylene group, which is optionally substituted by one or more groups selected from fluorine, chlorine and cyano and in which two or three non-adjacent alkylene --CH.sub.2-- groups are independently optionally replaced by a group D with the proviso that the total number of chain carbon atoms in the alkylene group does not exceed 24, wherein R.sup.1 represents hydrogen or lower alkyl.

23. Photoreactive **dendrimers** according to claim 22, wherein S.sub.2 is selected from a single covalent bond, --(CH.sub.2).sub.r--, --(CH.sub.2).sub.r--O--, --(CH.sub.2).sub.r--CO--, --(CH.sub.2).sub.r--CO--O--, --(CH.sub.2).sub.r--O--CO--, --(CH.sub.2).sub.r--CO--NR.sup.1--, --(CH.sub.2).sub.r--NR.sup.1--CO--, --(CH.sub.2).sub.r--NR.sup.1--, --(CH.sub.2).sub.r--O--(CH.sub.2).sub.s--, --(CH.sub.2).sub.r--CO--O--(CH.sub.2).sub.s--, --(CH.sub.2).sub.r--O--CO--(CH.sub.2).sub.s--, --(CH.sub.2).sub.r--NR.sup.1--CO--(CH.sub.2).sub.s--, --(CH.sub.2).sub.r--NR.sup.1--CO--O--(CH.sub.2).sub.s--, --(CH.sub.2).sub.r--O--(CH.sub.2).sub.s--O--, --(CH.sub.2).sub.r--CO--O--(CH.sub.2).sub.s--O--, --(CH.sub.2).sub.r--O--CO--(CH.sub.2).sub.s--O--, --(CH.sub.2).sub.r--NR.sup.1--CO--(CH.sub.2).sub.s--O--, --(CH.sub.2).sub.r--NR.sup.1--CO--O--(CH.sub.2).sub.s--O--, --(CH.sub.2).sub.r--O--(CH.sub.2).sub.s--CO--O-- and --(CH.sub.2).sub.r--O--(CH.sub.2).sub.s--O--CO--, wherein R.sup.1 is as defined herein above; r and s each represent an integer from 1 to 20; and r+s≤21. It is more preferred that r and s each represent an integer from 1 to 12. It is especially preferred that r+s≤15.

24. Photoreactive **dendrimers** according to claim 22, wherein S.sub.2 includes 1,2-ethylene, 1,3-propylene, 1,4-butylene, 1,5-pentylene, 1,6-hexylene, 1,7-heptylene, 1,8-octylene, 1,9-nonylene, 1,10-decylene, 1,11-undecylene, 1,12-dodecylene, 3-methyl-1,4-butylene, 3-propyleneoxy, 3-propyleneoxycarbonyl, 2-ethylenecarbonyloxy, 4-butyleneoxy, 4-butyleneoxycarbonyl, 3-propylenecarbonyloxy, 5-pentyleneoxy, 5-pentyleneoxycarbonyl, 4-butylenecarbonyloxy, 6-hexyleneoxy, 6-hexyleneoxycarbonyl, 5-pentylenecarbonyloxy, 7-heptyleneoxy, 7-heptyleneoxycarbonyl, 6-hexylenecarbonyloxy, 8-octyleneoxy, 8-octyleneoxycarbonyl, 7-heptylenecarbonyloxy, 9-nonyleneoxy, 9-nonyleneoxycarbonyl, 8-octylenecarbonyloxy, 10-decyleneoxy, 10-decyleneoxycarbonyl, 9-nonylenecarbonyloxy, 11-undecyleneoxy, 11-undecyleneoxycarbonyl, 10-decylenecarbonyloxy, 12-dodecylencoxy, 12-dodecyleneoxycarbonyl, 11-undecylenecarbonyloxy, 3-propyleneiminocarbonyl, 4-butyleneiminocarbonyl, 5-pentyleneiminocarbonyl, 6-hexyleneiminocarbonyl, 7-heptyleneiminocarbonyl, 8-octyleneiminocarbonyl, 9-nonyleneiminocarbonyl, 10-decyleneiminocarbonyl, 11-undecyleneiminocarbonyl, 12-dodecyleneiminocarbonyl,

2-ethylenecarbonylimino, 3-propylenecarbonylimino, 4-butylenecarbonylimino, 5-pentylenecarbonylimino, 6-hexylene-carbonylimino, 7-heptylenecarbonylimino, 8-octylenecarbonylimino, 9-nonylenecarbonylimino, 10-decylenecarbonylimino, 11-undecylenecarbonylimino, 6-(3-propyleneiminocarbonyloxy)-hexylene, 6-(3-propyleneoxy)hexylene, 6-(3-propyleneoxy)hexyloxy, 6-(3-propyleneiminocarbonyloxy)hexyloxy, 6-(3-propyleneiminocarbonyl)hexylene, 6-(3-propyleneiminocarbonyl)-hexyloxy and the like.

25. Photoreactive **dendrimers** according to claim 1, wherein the **terminal** moieties can also be hydrogen; or a group like group B which is able to react or interact with a second material like polymers, oligomers, monomers, photoactive polymers, photoactive oligomers and/or photoactive monomers or surfaces; or an unit such as a straight-chain or branched alkyl group which is unsubstituted, mono or poly-substituted by fluorine, chlorine, cyano, having 1 to 24 carbon atoms, wherein one or more --CH.sub.2-- groups may independently be replaced by a group D, with the proviso that oxygen atoms are not directly attached to each other.

26. Photoreactive **dendrimers** according to claim 1, wherein at least four **terminal** moieties are photoactive groups.

27. Photoreactive **dendrimers** according to claim 1, wherein the number of branching units per **dendrimer** is at least 3.

28. Photoreactive **dendrimers** according to claim 1, wherein the branching units are represented by dendritic blocks of the general formulae IIa, IIb or a combination of them, for example formula IIc: ##STR10## wherein the broken line indicates the point of linkage to the core portion or to the Z units of the previous generation of branching units; and the full line indicates the point of linkage to the E residue of the next generation of branching units or the point of linkage to the **terminal** groups; and wherein E represents an organic residue; Z represents a single bond or a spacer unit such as a straight-chain or branched alkylene group which is unsubstituted, mono or poly-substituted by fluorine, chlorine, having 1 to 24 carbon atoms, wherein one or more --CH.sub.2-- groups may independently be replaced by a group D, with the proviso that oxygen atoms are not directly attached to each other, or Z may also represent a photoreactive group like groups represented by general formula Ia and Ib wherein B in this case indicates the point of linkage to E and wherein A, S.sub.1, S.sub.2, Q, X and Y are as defined above.

29. Photoreactive **dendrimers** according to claim 28, wherein the branching units are groups of formula Ia and groups of formula IIc, while groups of formula IIb, if present, are favorably located in the outermost generation.

30. Photoreactive **dendrimers** according to claim 29, wherein the dendritic blocks are groups of formulae Ia.

31. Photoreactive **dendrimers** according to claim 28, wherein the groups E are aromatic, alicyclic or CR.sup.1-- units wherein R.sup.1 has the meaning defined above.

32. Photoreactive **dendrimers** according to claim 31, wherein the groups E are selected form 1,2,3-benzenetriyl, 1,3,4-benzenetriyl, 1,3,5-benzenetriyl or a group CR.sup.1--.

33. Photoreactive **dendrimers** according to claim 28, wherein Z is selected form from a single covalent bond, --O--, --CO--O--, NR.sup.1--, --NR.sup.1--CO--, --CO--NR.sup.1--, --NR.sup.1--CO--O--, --O--CO--NR.sup.1--, --NR.sup.1--C O--NR.sup.1--, --CH.dbd.CH--, --C.tbd.C--, --O--CO--O-- and a straight-chain or branched alkylene group, which is optionally substituted by one or more groups selected from fluorine, chlorine and cyano and in which one up to four

non-adjacent alkylene --CH.sub.2-- groups are independently optionally replaced by a group D with the proviso that the total number of chain carbon atoms in the alkylene group does not exceed 30 and wherein R.sup.1 represents hydrogen or lower alkyl.

34. Photoreactive **dendrimers** according to claim 33, wherein Z represents photoreactive groups like groups represented by general formula Ia and Ib wherein B in this case indicates the point of linkage to E and wherein A, S.sub.1, S.sub.2, Q, X and Y are as defined above.

35. Photoreactive **dendrimers** according to claim 33, wherein Z includes 1,2-ethylene, 1,3-propylene, 1,4-butylene, 1,5-pentylene, 1,6-hexylene, 1,7-heptylene, 1,8-octylene, 1,9-nonylene, 1,10-decylene, 1,11-undecylene, 1,12-dodecylene, 3-methyl--1,4-butylene, 3-propyleneoxy, 3-propyleneoxycarbonyl, 2-ethylenecarbonyloxy, 4-butyleneoxy, 4-butyleneoxycarbonyl, 3-propylenecarbonyloxy, 5-pentyleneoxy, 5-pentyleneoxycarbonyl, 4-butylenecarbonyloxy, 6-hexyleneoxy, 6-hexyleneoxycarbonyl, 5-pentylenecarbonyloxy, 7-heptyleneoxy, 7-heptyleneoxycarbonyl, 6-hexylenecarbonyloxy, 8-octyleneoxy, 8-octyleneoxycarbonyl, 7-heptylenecarbonyloxy, 9-nonyleneoxy, 9-nonyleneoxycarbonyl, 8-octylenecarbonyloxy, 10-decyleneoxy, 10-decyleneoxycarbonyl, 9-nonylenecarbonyloxy, 11-undecyleneoxy, 11-undecyleneoxycarbonyl, 10-decylenecarbonyloxy, 12-dodecyleneoxy, 12-dodecyleneoxycarbonyl, 11-undecylenecarbonyloxy, 3-propyleneiminocarbonyl, 4-butyleneiminocarbonyl, 5-pentyleneiminocarbonyl, 6-hexyleneiminocarbonyl, 7-heptyleneiminocarbonyl, 8-octyleneiminocarbonyl, 9-nonyleneiminocarbonyl, 10-decyleneiminocarbonyl, 11-undecyleneiminocarbonyl, 12-dodecyleneiminocarbonyl, 2-ethylenecarbonylimino, 3-propylenecarbonylimino, 4-butylenecarbonylimino, 5-pentylenecarbonylimino, 6-hexylenecarbonylimino, 7-heptylenecarbonylimino, 8-octylenecarbonylimino, 9-nonylenecarbonylimino, 10-decylenecarbonylimino, 11-undecylenecarbonylimino, 6-(3-propyleneiminocarbonyloxy)hexylene, 6-(3-propyleneoxy)hexylene, 6-(3-propyleneoxy)-hexyloxy, 6-(3-propyleneiminocarbonyloxy)hexyloxy, 6-(3-propyleneiminocarbonyl)hexyl, 6-(3-propyleneiminocarbonyl)hexyloxy, 1,2-ethylenedioxy, 1,3-propylenedioxy, 1,4-butylenedioxy, 1,5-pentylenedioxy, 1,6-hexylenedioxy, 1,7-heptylenedioxy, 1,8-octylenedioxy, 1,9-nonylenedioxy, 1,10-decylenedioxy, 1,11-undecylenedioxy, 1,12-dodecylenedioxy, 2-{4-[4-(2-oxyethyl)cyclohexyl]phenyl}ethoxy, 2-[4'-(4-oxybutyl)-1,1'biphenyl-4-yl]ethoxy, 2-{4-[4-(2-oxy-ethyl)phenyl}ethoxy, 2-{4-[4-(2-carbonyloxyethyl)-cyclohexyl]phenyl}ethoxy, 2-[4'-(4-carbonyloxybutyl)-1,1'biphenylene-4-yl]ethoxy, 6-{4-[4-(2-carbonyloxyethyl)phenyl}hexyloxy, 5-{[4'-(4-oxybutoxy)-1,1'-biphenyl-4-yl]oxy}pentylcarbonyloxy, 2-oxyethylene, 3-oxypropylene, 4-oxybutylene, 5-oxypentylene, 6-oxyhexylene, 7-oxyheptylene, 8-oxyoctylene, 9-oxynonylene, 10-oxydecylene, 11-oxyundecylene, 12-oxydodecylene, 2-(oxycarbonyl)ethylene, 3-(oxycarbonyl)propylene, 4-(oxycarbonyl)butylene, 5-(oxycarbonyl)pentylene, 6-(oxycarbonyl)hexylene, 7-(oxycarbonyl)heptylene, 8-(oxycarbonyl)octylene, 9-(oxycarbonyl)-nonylene, 10-(oxycarbonyl)decylene, 11-(oxycarbonyl)undecylene, 12-(oxycarbonyl)-dodecylene, 2-(carbonyloxy)ethylene, 3-(carbonyloxy)propylene, 4-(carbonyloxy)butylene, 5-(carbonyloxy)pentylene, 6-(carbonyloxy)hexylene, 7-(carbonyloxy)heptylene, 8-(carbonyloxy)octylene, 9-(carbonyloxy)nonylene, 10-(carbonyloxy)decylene, 11-(carbonyloxy)undecylene, 12-(carbonyloxy)dodecylene, 2-(carbonylimino)ethylene, 3-(carbonylimino)propylene, 4-(carbonylimino)butylene, 5-(carbonylimino)pentylene, 6-(carbonylimino)hexylene, 7-(carbonylimino)heptylene, 8-(carbonylimino)octylene, 9-(carbonylimino)nonylene, 10-(carbonylimino)decylene, 11-(carbonylimino)undecylene, 12-(carbonylimino)dodecylene, 2-iminoethylene, 3-iminopropylene, 4-iminobutylene, 5-iminopentylene, 6-iminohexylene, 7-iminoheptylene, 8-iminooctylene, 9-iminononylene, 10-iminodecylene, 11-iminoundecylene, 12-iminododecylene,

2-iminocarbonylethylene, 3-iminocarbonylpropylene, 4-iminocarbonylbutylene, 5-iminocarbonylpentylene, 6-iminocarbonylhexylene, 7-iminocarbonylheptylene, 8-iminocarbonyloctylene, 9-iminocarbonylnonylene, 10-iminocarbonyldecylene, 11-iminocarbonylundecylene, 12-iminocarbonyldodecylene, 2-(2-ethyleneoxy)ethylene, 2-(3-propyleneoxy)ethylene, 6-(4-butyleneoxy)hexylene, 2-(2-ethyleneiminocarbonyl)ethylene, 2-(3-propyleneiminocarbonyl)ethylene, 6-(4-butyleneiminocarbonyl)hexylene, 6-(3-propyleneiminocarbonyloxy)hexylene, 6-(3-propyleneiminocarbonyl)hexylene, 6-oxyhexyl(2E)-3-[4-(4-oxybutoxy)-3-methoxyphenyl]-2-propenoate, 8-oxyoctyl(2E)-3-[4-(5-oxypentoxy)phenyl]-2-propenoate, 6-oxyhexyl(2E)-3-[4-(4-(carbonyloxy)butoxy)-3-methoxyphenyl]-2-propenoate, 8-(oxycarbonyl)octyl(2E)-3-[4-(5-oxypentoxy)phenyl]-2-propenoate and the like.

36. Photoreactive **dendrimers** according to any preceding claim 1, wherein the core portion is covalently bonded to one, two, three or four dendritic blocks and are represented by formulae IIIa, IIIb, IIIc, IIId and IIIe: ##STR11## wherein the broken line indicates the point of linkage with a branching unit and wherein F represents a single bond or a unit such as a straight-chain or branched alkylene group which is unsubstituted, mono or poly-substituted by fluorine, chlorine, having 1 to 40 carbon atoms, wherein one or more --CH.sub.2-- groups may independently be replaced by a group D, with the proviso that oxygen atoms are not directly attached to each other, or F represents a photoreactive group like groups represented by general formula Ia and Ib wherein B in this case indicates the point of linkage to the first generation of the **dendrimer**; G represents hydrogen; a group which is able to react or interact with a second material like polymers, oligomers, monomers, photoactive polymers, photoactive oligomers and/or photoactive monomers or surfaces; or a monomer repeating unit in a homo or copolymer from a radical or cationic polymerisation; K represents a nitrogen atom, a carbon atom, a group CR.sup.1-- or an aromatic or alicyclic group, which is optionally substituted by a group selected from fluorine, chlorine, cyano and a C.sub.1-18 cyclic, straight-chain or branched alkyl group, which is optionally substituted by a single cyano group or by one or more halogen atoms and in which one or more non-adjacent alkyl --CH.sub.2-- groups are optionally replaced by a group selected from --O--, --CO--, --CO--O--, --O--CO--, --Si(CH.sub.3).sub.2--O--Si(CH.sub.3).sub.2--, --NR.sup.1--, --NR.sup.1--CO--, --CO--NR.sup.1--, --NR.sup.1--CO--O--, --O--CO--NR.sup.1--, --NR.sup.1--CO--NR.sup.1--, --CH.dbd.CH--, --C.tbd.C-- and --O--CO--O--, wherein R.sup.1 represents hydrogen or lower alkyl; and J represents a carbon atom or an aromatic or alicyclic group, which is optionally substituted by a group selected from fluorine, chlorine, cyano and a C.sub.1-18 cyclic, straight-chain or branched alkyl group, which is optionally substituted by a single cyano group or by one or more halogen atoms and in which one or more non-adjacent alkyl --CH.sub.2-- groups are optionally replaced by a group selected from --O--, --CO--, --CO--O--, --O--CO--, --Si(CH.sub.3).sub.2--O--Si(CH.sub.3).sub.2--, --NR.sup.1--, --NR.sup.1--CO--, --CO--NR.sup.1--, --NR.sup.1--CO--O--, --O--CO--NR.sup.1--, --NR.sup.1--CO--NR.sup.1--, --CH.dbd.CH--, --C.tbd.C-- and --O--CO--O--, wherein R.sup.1 represents hydrogen or lower alkyl.

37. Photoreactive **dendrimers** according to claim 36, wherein F is selected from a single covalent bond, --O--, --CO--O--, --O--CO--, --NR.sup.1--, --NR.sup.1--CO--, --CO--NR.sup.1--, --NR.sup.1--CO--O--, --O--CO--NR.sup.1--, --NR.sup.1--CO--NR.sup.1--, --CH.dbd.CH--, --C.tbd.C--, --O--CO--O-- and a straight-chain or branched alkylene group, which is optionally substituted by one or more groups selected from fluorine, chlorine and cyano and in which up to four non-adjacent alkylene --CH.sub.2-- groups are independently optionally replaced by a group D with the proviso that the total number of chain carbon atoms in the alkylene group does not exceed 30, wherein R.sup.1 represents hydrogen or lower alkyl.

38. Photoreactive **dendrimers** according to claim 37, wherein F represents photoreactive groups like a group represented by general formula Ia or Ib, wherein B in this case indicates the point of linkage to the first generation of the **dendrimer** and wherein A, S.sub.1, S.sub.2, Q, X and Y are as defined above.

39. Photoreactive **dendrimers** according to claim 37, wherein F includes 1,2-ethylene, 1,3-propylene, 1,4-butylene, 1,5-pentylene, 1,6-hexylene, 1,7-heptylene, 1,8-octylene, 1,9-nonylene, 1,10-decylene, 1,11-undecylene, 1,12-dodecylene, 3-methyl--1,4-butylene, 3-propyleneoxy, 3-propyleneoxycarbonyl, 2-ethylenecarbonyloxy, 4-butyleneoxy, 4-butyleneoxycarbonyl, 3-propylenecarbonyloxy, 5-pentyleneoxy, 5-pentyleneoxycarbonyl, 4-butylenecarbonyloxy, 6-hexyleneoxy, 6-hexyleneoxycarbonyl, 5-pentylenecarbonyloxy, 7-heptyleneoxy, 7-heptyleneoxycarbonyl, 6-hexylenecarbonyloxy, 8-octyleneoxy, 8-octyleneoxycarbonyl, 7-heptylenecarbonyloxy, 9-nonyleneoxy, 9-nonyleneoxycarbonyl, 8-octylenecarbonyloxy, 10-decyleneoxy, 10-decyleneoxycarbonyl, 9-nonylenecarbonyloxy, 11-undecyleneoxy, 11-undecyleneoxycarbonyl, 10-decylenecarbonyloxy, 12-dodecyleneoxy, 12-dodecyleneoxycarbonyl, 11-undecylenecarbonyloxy, 3-propyleneiminocarbonyl, 4-butyleneiminocarbonyl, 5-pentyleneiminocarbonyl, 6-hexyleneiminocarbonyl, 7-heptyleneiminocarbonyl, 8-octyleneiminocarbonyl, 9-nonyleneiminocarbonyl, 10-decyleneiminocarbonyl, 11-undecyleneiminocarbonyl, 12-dodecyleneiminocarbonyl, 2-ethylenecarbonylimino, 3-propylenecarbonylimino, 4-butylenecarbonylimino, 5-pentylenecarbonylimino, 6-hexylenecarbonylimino, 7-heptylenecarbonylimino, 8-octylenecarbonylimino, 9-nonylenecarbonylimino, 10-decylenecarbonylimino, 11-undecylenecarbonylimino, 6-(3-propyleneiminocarbonyloxy)hexylene, 6-(3-propyleneoxy)hexylene, 6-(3-propyleneoxy)-hexyloxy, 6-(3-propyleneiminocarbonyloxy)hexyloxy, 6-(3-propyleneiminocarbonyl)hexyl, 6-(3-propyleneiminocarbonyl)hexyloxy, 1,2-ethylenedioxy, 1,3-propylenedioxy, 1,4-butylenedioxy, 1,5-pentylenedioxy, 1,6-hexylenedioxy, 1,7-heptylenedioxy, 1,8-octylenedioxy, 1,9-nonylenedioxy, 1,10-decylenedioxy, 1,11-undecylenedioxy, 1,12-dodecylenedioxy, 2-{4-[4-(2-oxyethyl)cyclohexyl]phenyl}ethoxy, 2-[4'-(4-oxybutyl)-1,1'biphenyl-4-yl]ethoxy, 2-{4-[4-(2-oxy-ethyl)phenyl}ethoxy, 2-{4-[4-(2-carbonyloxyethyl)-cyclohexyl]phenyl}ethoxy, 2-[4'-(2-carbonyloxybutyl)-1,1'biphenylene-4-yl]ethoxy, 6-{4-[4-(2-carbonyloxyethyl)phenyl}hexyloxy, 5-{[4'-(4-oxybutoxy)-1,1'-biphenyl-4-yl]oxy}pentylcarbonyloxy, 2-oxyethylene, 3-oxypropylene, 4-oxybutylene, 5-oxypentylene, 6-oxyhexylene, 7-oxyheptylene, 8-oxyoctylene, 9-oxynonylene, 10-oxydecylene, 11-oxyundecylene, 12-oxydodecylene, 2-(oxycarbonyl)ethylene, 3-(oxycarbonyl)propylene, 4-(oxycarbonyl)butylene, 5-(oxycarbonyl)pentylene, 6-(oxycarbonyl)hexylene, 7-(oxycarbonyl)heptylene, 8-(oxycarbonyl)octylene, 9-(oxycarbonyl)-nonylene, 110-(oxycarbonyl)decylene, 11-(oxycarbonyl)undecylene, 12-(oxycarbonyl)-dodecylene, 2-(carbonyloxy)ethylene, 3-(carbonyloxy)propylene, 4-(carbonyloxy)butylene, 5-(carbonyloxy)pentylene, 6-(carbonyloxy)hexylene, 7-(carbonyloxy)heptylene, 8-(carbonyloxy)octylene, 9-(carbonyloxy)nonylene, 110-(carbonyloxy)decylene, 11-(carbonyloxy)undecylene, 12-(carbonyloxy)dodecylene, 2-(carbonylimino)ethylene, 3-(carbonylimino)propylene, 4-(carbonylimino)butylene, 5-(carbonylimino)pentylene, 6-(carbonylimino)hexylene, 7-(carbonylimino)heptylene, 8-(carbonylimino)octylene, 9-(carbonylimino)nonylene, 110-(carbonylimino)decylene, 11-(carbonylimino)undecylene, 12-(carbonylimino)dodecylene, 2-iminoethylene, 3-iminopropylene, 4-iminobutylene, 5-iminopentylene, 6-iminohexylene, 7-iminoheptylene, 8-iminooctylene, 9-iminononylene, 10-iminodecylene, 11-iminoundecylene, 12-iminododecylene, 2-iminocarbonylethylene, 3-iminocarbonylpropylene, 4-iminocarbonylbutylene, 5-iminocarbonylpentylene, 6-iminocarbonylhexylene, 7-iminocarbonylheptylene, 8-

iminocarbonyloctylene, 9-iminocarbonylnonylene, 10-iminocarbonyldecylene, 11-iminocarbonylundecylene, 12-iminocarbonyldodecylene, 2-(2-ethyleneoxy)ethylene, 2-(3-propyleneoxy)ethylene, 6-(4-butyleneoxy)hexylene, 2-(2-ethyleneiminocarbonyl)ethylene, 2-(3-propyleneiminocarbonyl)ethylene, 6-(4-butyleneiminocarbonyl)hexylene, 6-(3-propyleneiminocarbonyloxy)hexylene, 6-(3-propyleneiminocarbonyl)hexylene, 6-oxyhexyl(2E)-3-[4-(4-oxybutoxy)-3-methoxyphenyl]-2-propenoate, 8-oxyoctyl(2E)-3-[4-(5-oxypentoxy)phenyl]-2-propenoate, 1,11-bis-[(2E)-3-(4-oxyphenyl)-2-propenoate]undecylene and the like

40. Photoreactive **dendrimers** according to anyone of claims 36 to 39, wherein G is selected from hydrogen; a radically or cationically polymerizable group, or also from mono-, di- or tri-alkoxy or halogeno silanes.

41. Photoreactive **dendrimers** according to claim 40, wherein G is selected from hydrogen, a radically or cationically polymerizable group or a monomer unit in a homo or copolymer from a radical or cationic polymerisation.

42. Photoreactive **dendrimers** according to claim 40, wherein G is a radically or cationically polymerizable group.

43. Photoreactive **dendrimers** according to claim 36, wherein K is a nitrogen atom, a carbon atom, an aromatic, an alicyclic or a CR.sup.1-- unit wherein R.sup.1 is as defined above.

44. Photoreactive **dendrimers** according to claim 43, wherein K is selected form 1,2,3-benzenetriyl, 1,3,4-benzenetriyl, 1,3,5-benzenetriyl or a group CR.sup.1--.

45. Photoreactive **dendrimers** according to claim 36, wherein J is a carbon atom, an aromatic or an alicyclic unit.

46. Photoreactive **dendrimers** according to claim 45, wherein J is a carbon atom.

47. Photoreactive **dendrimers** according to claim 36, wherein the core portions are groups of formulae IIIa, IIIb, IIIc, IIId.

48. Photoreactive **dendrimers** according to claim 47, wherein the core portions are groups of formulae IIIa and IIIb.

49. Photoreactive **dendrimers** according to claim 1 further comprising additives such as silane-containing compounds and epoxy-containing cross-linking agents,

50. Photoreactive **dendrimers** according to claim 49, wherein the epoxy-containing crosslinking agents include 4,4'-methylenebis(N,N-diglycidylaniline), trimethylolpropane triglycidyl ether, benzene-1,2,4,5-tetracarboxylic acid 1,2:4,5-N,N'-diglycidyldiimide, **polyethylene** glycol diglycidyl ether, and N,N-diglycidyl-cyclohexylamine.

51. Photoreactive **dendrimers** according to claim 1 further comprising additives such as a photosensitiser, a photoradical generator and/or a cationic photoinitiator.

52. Photoreactive **dendrimers** according to claim 51, wherein the photoactive additives include 2,2-dimethoxyphenylethanone, a mixture of diphenylmethanone and N,N-dimethylbenzenamine or ethyl 4-(dimethylamino)benzoate, xanthone, thioxanthone, IRGACURE.TM. 184, 369, 500, 651 and 907, Michler's ketone and triaryl sulfonium salts.

53. Photoreactive **dendrimers** according to claim 1 which, when irradiated over a relatively short time with polarized light, result in stable, high-resolution patternable orientation layers.

54. Orientation layers for liquid crystals and in the construction of unstructured and structured optical elements and multi-layer systems made by using one or more photoreactive **dendrimers**.

55. Orientation layers for liquid crystals and in the construction of unstructured and structured optical elements and multi-layer systems comprising one or more photoreactive **dendrimers** in at least partially crosslinked form.

56. Orientation layers according to claim 54, wherein the photoreactive **dendrimers** are as defined according to claim 1.

57. Orientation layers according to claim 54, further comprising polymers, oligomers, monomers, photoactive polymers, photoactive oligomers and/or photoactive monomers.

58. Optical element comprising one or more photoactive **dendrimers** in at least partially crosslinked form.

59. Optical element according to claim 57, wherein the photoreactive **dendrimers** are as defined according to claim 1.

60. Electrooptical components comprising one or more orientation layer according to claim 54.

61. Use of photoreactive **dendrimers** alone or in combination with polymers, oligomers, monomers, photoactive polymers, photoactive oligomers and/or photoactive monomers in the production of orientation layers for liquid crystals.

62. Use of photoreactive **dendrimers** alone or in combination with polymers, oligomers, monomers, photoactive polymers, photoactive oligomers and/or photoactive monomers in the construction of unstructured and structured optical elements and multi-layer systems.

63. Use according to claim 61, wherein the photoreactive **dendrimers** are as defined according to claim 1.

L10 ANSWER 4 OF 19 USPATFULL on STN
AN 2004:326795 USPATFULL
TI Microparticles for microarterial imaging and radiotherapy
IN Line, Bruce R., Cockeysville, MD, UNITED STATES
Van Echo, David A., Columbia, MD, UNITED STATES
Kennedy, Andrew S., Apex, NC, UNITED STATES
Ghandehari, Hamidreza, Ellicott City, MD, UNITED STATES
Nan, Anjan, Baltimore, MD, UNITED STATES
PA University of Maryland, Baltimore (U.S. corporation)
PI US 2004258614 A1 20041223
AI US 2004-762507 A1 20040123 (10)
PRAI US 2003-479832P 20030620 (60)
DT Utility
FS APPLICATION
LREP SUGHRUE MION, PLLC, 2100 PENNSYLVANIA AVENUE, N.W., SUITE 800, WASHINGTON, DC, 20037
CLMN Number of Claims: 86
ECL Exemplary Claim: 1
DRWN 4 Drawing Page(s)
LN.CNT 2497
CAS INDEXING IS AVAILABLE FOR THIS PATENT.
AB Microparticles comprising a core, at least one linking carrier on the core, and at least one radioactive therapeutic agent covalently bonded to the linking carrier. The radioactive therapeutic agent may be a radionuclide or a radiopharmaceutical. A method of radiation therapy of a patient by administering to the patient the microparticles. The treatment may be radiation therapy to treat cancer or a tumor. A kit for preparing a microparticle treatment and a method for using the kit to

prepare a microparticle treatment dose. The microparticle treatment dose may be made at a location of administration or at a site proximate to the location of administration, such as a local radiopharmacy, laboratory, hospital or physician's office.

CLM What is claimed is:

1. A microparticle comprising a core, at least one linking carrier on said core, wherein said linking carrier comprises a biocompatible polymer, and at least one radioactive therapeutic agent covalently bonded to said linking carrier; wherein said microparticle has a diameter in the range of from 5 to 200 microns and said microparticle is non-biodegradable.

2. The particle of claim 1, wherein said microparticle is not water swellable.

3. The particle of claim 1, wherein said radioactive therapeutic agent is a radionuclide or a radiopharmaceutical.

4. The particle of claim 1, wherein said at least one radioactive therapeutic agent is at least one radionuclide selected from the group consisting of an alpha-emitting radionuclide, a beta-emitting radionuclide and a gamma-emitting radionuclide.

5. The particle of claim 1, wherein said at least one radioactive therapeutic agent is an alpha-emitting radionuclide and a beta-emitting radionuclide.

6. The particle of claim 1, wherein said at least one radioactive therapeutic agent is an alpha-emitting radionuclide, a beta-emitting radionuclide and a gamma-emitting radionuclide.

7. The particle of claim 5, wherein said radioactive therapeutic agent is at least one radionuclide selected from the group consisting of iridium, radium, cesium, phosphorus, yttrium, rhenium, actinium, bismuth, astatine, technetium, indium, iodine, and carbon, nitrogen, fluorine, sodium, magnesium, aluminum, silicon, potassium, vanadium, manganese, gallium, niobium, iodine, lead, Y-90, Bi-213, At-211, I-123, I-125, I-131, At-211, Cu-67, Sc-47, Ga-67, Rh-105, Pr-142, Nd-147, Pm-151, Sm-153, Ho-166, Gd-159, Th-161, Eu-152, Er-171, Re-186, Re-188, Tc-99m, In-111, Ga-67, Rh-105, I-123, Nd-147, Pm-151, Sm-153, Gd-159, Th-161, Er-171, Re-186, Re-188, and T1-201.

8. The particle of claim 1, wherein said radioactive therapeutic agent is yttrium-90.

9. The particle of claim 1, wherein said at least one radioactive therapeutic agent comprises a therapeutic radionuclide and an imaging or diagnostic radionuclide both chemically bonded to said linking carrier.

10. The particle of claim 9, wherein said therapeutic radionuclide is a beta-emitting radionuclide and said an imaging or diagnostic radionuclide is a gamma-emitting radionuclide.

11. The particle of claim 10, wherein said therapeutic radionuclide is yttrium-90 and said an imaging or diagnostic radionuclide is selected from the group consisting of indium-111 and Tc-99m.

12. The particle of claim 1, wherein said radioactive therapeutic agent is bonded to said linking carrier through one or more spacer groups.

13. The particle of claim 1, wherein said radioactive therapeutic agent is bound to said linking carrier by a chelator group.

14. The particle of claim 13, wherein said chelator group is at least one selected from the group consisting of cyclohexyldiethylenetriaminepe ntaacetic acid ligand (CHX-DTPA), diethylenetriaminepentaacetic acid (DTPA), ethylenediaminetetraacetic acid (EDTA), 1,4,7,10-tetraazacyclododecane-N,N',N,"N'"tetraacetate (DOTA),

tetraazacyclotetradecane-N,N", N"N"-tetraacetic acid (TETA), cyclohexyl 1,2-diamine tetra-acetic acid (CDTA), ethyleneglycol-O,O'-bis(-2-aminoethyl)-N,N,N',N'-tetra-acetic acid (EGTA), N,N-bis(hydroxybenzyl)-ethylenediamine-N,N'-diacetic acid (HBED), triethylene tetramine hexa-acetic acid (TTHA), hydroxyethyldiamine triacetic acid (HEDTA), hydroxyethylidene diphosphonate (HEDP), dimercaptosuccinic acid (DMSA), diethylenetriaminetetramethylenephosphonic acid (DTTP) and 1-(p-aminobenzyl)-DTPA, 1,6-diamino hexane-N,N,N',N'-tetraacetic acid, DPDP, and ethylenebis (oxyethylenenitrilo)-tetraacetic acid.

15. The particle of claim 13, wherein said radioactive therapeutic agent is yttrium-90 and said chelator group is DOTA.

16. The particle of claim 1, wherein said core is non-ceramic and non-radioactively labeled.

17. The particle of claim 1, wherein said core comprises a polymer selected from the group consisting of polyacrylate, ethylene-vinyl acetate polymer, an acyl substituted cellulose acetate, polyurethane, polystyrene, polyvinylchloride, polyvinyl flouride, poly(vinyl imidazole), chlorosulphonate polyolefin, **polyethylene** oxide, blends thereof, and copolymers thereof, a polyphosphazine, a poly(vinyl alcohol), a polyamide, a polycarbonate, a polyalkylene, a polyacrylamide, a polyalkylene glycol, a polyalkylene oxide, a polyalkylene terephthalate, a polyvinyl ether, a polyvinyl ester, a polyvinyl halide, polyvinylpyrrolidone, a polyglycolide, a polysiloxane, and copolymers thereof, a alkyl cellulose, an hydroxyalkyl cellulose, a cellulose ether, a cellulose ester, and a nitrocellulose.

18. The particle of claim 1, wherein said at least one linking carrier is selected from the group consisting of a linear polymer, a branched polymer, and a dendromer polymer.

19. The particle of claim 18, wherein said at least one linking carrier is a **dendrimer**.

20. The particle of claim 19, wherein said **dendrimer** has a disulfide bond in its core.

21. The particle of claim 19, wherein said **dendrimer** has a final external layer which is capped with a reactive group.

22. The particle of claim 21, wherein said reactive group is an amine or carboxyl group.

23. The particle of claim 21, wherein said reactive group is derivatized with at least one selected from the group consisting of a targeting entity and a therapeutic entity.

24. The particle of claim 19, wherein said **dendrimer** has a **terminal** functional group which is accessible to a chelate containing compound which is capable of interacting with the functional groups.

25. The particle of claim 24, wherein said functional group is at least one selected from the group consisting of ester group, ether group, thiol group, carbonyl group, hydroxyl group, amide group, carboxylic group, and imide group.

26. The particle of claim 19, comprising multiple **dendrimers**, wherein said **dendrimers** are monodispersed.

27. The particle of claim 18, wherein said linking carriers are linear polymers.

28. The particle of claim 1, wherein said radioactive therapeutic agent is covalently bonded to said linking carrier via a bifunctional linker, carbodiimide condensation, or a disulfide bond formation.

29. The particle of claim 1, wherein said particle does not leach radionuclide.

30. The particle of claim 1, wherein said particle is spheroidal.

31. The particle of claim 1, wherein said particle has a density in the range of from 1 to 4 gm/cm.sup.3.

32. The particle of claim 1, wherein said particle has a density in the range of from 1 to 2 gm/cm.sup.3.

33. The particle of claim 1, wherein said particle further comprises a second therapeutic agent or a diagnostic agent.

34. The particle of claim 33, wherein said second therapeutic agent or said diagnostic agent is at least one selected from the group consisting of a metal chelate complex, a drug, a prodrug, a radionuclide, a boron addend, a labeling compound, a toxin, a cytokine, a lymphokine, a chemokine, an immunomodulator, a radiosensitizer, an asparaginase, a radioactive halogens, a chemotherapy drug and a contrast agent.

35. A particulate material comprising microparticles having: a core, at least one linking carrier on said core, wherein said linking carrier comprises a biocompatible polymer, and at least one radioactive therapeutic agent covalently bonded to said linking carrier; wherein said microparticles have a diameter in the range of from 5 to 200 microns and said microparticles are non-biodegradable.

36. The particulate material of claim 35, wherein said microparticles have a diameter in the range of from 8-100 microns.

37. The particulate material of claim 35, wherein said microparticles have a diameter in the range of from 25-50 microns.

38. The particulate material of claim 35, wherein said microparticles have a diameter in the range of from 20-30 microns.

39. The particulate material of claim 35, wherein said microparticles have substantially equivalent particle sizes.

40. The particulate material of claim 35, wherein said microparticles are sufficiently large so as to avoid phagocytosis.

41. A method of radiation therapy of a patient, which comprises administering to the patient microparticles, wherein said microparticles comprise a core, at least one linking carrier on said core, wherein said linking carrier comprises a biocompatible polymer, and at least one radioactive therapeutic agent covalently bonded to said linking carrier; wherein said microparticle has a diameter in the range of from 5 to 200 microns and said microparticle is non-biodegradable.

42. The method of radiation therapy of a patient of claim 41, wherein said microparticles are administered internally.

43. The method of radiation therapy of a patient of claim 41, wherein the administration is direct to a lesion or through a vascular route.

44. The method of radiation therapy of a patient of claim 41, wherein said radiation therapy treats cancer or a tumor.

45. The method of radiation therapy of a patient of claim 44, wherein said cancer is primary or secondary cancer of the liver.

46. The method of radiation therapy of a patient of claim 41, wherein said radiation therapy treats a highly vascularized tumor or a tumor which has a single dominant arterial vascular supply.

47. The method of radiation therapy of a patient of claim 46, wherein said microparticles are injected into an artery supplying a tumor.

48. The method of radiation therapy of a patient of claim 41, wherein said radiation therapy treats hepatic cancer, rheumatoid arthritis, a solid cancer, liver cancer, brain cancer, breast cancer and/or ovary cancer.

49. The method of radiation therapy of a patient of claim 41, wherein said radiation therapy treats renal cell carcinoma, hepatoma, sarcomas, cancer of the head or neck, and/or a central nervous system tumor.

50. The method of radiation therapy of a patient of claim 41, wherein said at least one radioactive therapeutic agent is at least one radionuclide selected from the group consisting of an alpha-emitting radionuclide, a beta-emitting radionuclide and a gamma-emitting radionuclide.

51. The method of radiation therapy of a patient of claim 50, wherein said at least one radioactive therapeutic agent is an alpha-emitting radionuclide and a beta-emitting radionuclide.

52. The method of radiation therapy of a patient of claim 51, wherein said at least one radioactive therapeutic agent is an alpha-emitting radionuclide, a beta-emitting radionuclide and a gamma-emitting radionuclide.

53. The method of radiation therapy of a patient of claim 41, comprising radiation treatment and imaging or diagnosing.

54. The method of radiation therapy of a patient of claim 53, wherein said imaging or diagnosing is during the life of the radiation.

55. The method of radiation therapy of a patient of claim 53, wherein said imaging or diagnosing is post life of the radiation.

56. The method of radiation therapy of a patient of claim 51, further comprising assaying the gamma radiation to determine the location of the microparticles in the patient.

57. The method of radiation therapy of a patient of claim 41, wherein said particles are immobilized at a site of administration.

58. The method of radiation therapy of a patient of claim 41, wherein said particles do not release a significant amount of radiation emmitting radioisotope into the circulation system upon administration.

59. The method of radiation therapy of a patient of claim 41, wherein said particles have a diameter of from 15 to 35 microns.

60. A kit for preparing a microparticle treatment dose for a patient in need thereof, wherein said treatment dose comprises the particulate material of claim 35, wherein said kit comprises particle cores, which do not comprise radionuclide, linkers for attaching at least one radionuclide to said particle cores, and instructions or a means for obtaining instructions for preparing said microparticle treatment dose.

61. The kit for preparing a microparticle treatment dose of claim 60, wherein said kit contains a radionuclide.

62. The kit for preparing a microparticle treatment dose of claim 60, wherein a radionuclide is provided separately from said kit.

63. The kit for preparing a microparticle treatment dose of claim 60, further comprising at least one component selected from the group consisting of an inert pharmaceutically acceptable carrier, a formulating agent, an adjuvant, an active agent, water, saline, a transfer ligand, a reducing agent, a lyophilization aid, a stabilization

aid, a solubilization aid, a bacteriostat, a buffer, an X-ray contrast agent, an ultrasound contrast agent, and a metallopharmaceutical.

64. The kit for preparing a microparticle treatment dose of claim 60, further comprising at least one component selected from the group consisting of a syringe, shielding, and imaging equipment.

65. The kit for preparing a microparticle treatment dose of claim 60, wherein said kit comprises multiple types of cores and multiple types of linkers.

66. A method of using the kit of claim 60 to prepare a microparticle treatment dose for a patient in need thereof, determining the type and dosimety of microparticle treatment needed from a prescription for said patient and preparing said microparticle treatment dose from said instructions or said means for obtaining instructions.

67. A method of using the kit of claim 60 to prepare a microparticle treatment dose for a patient in need thereof, determining the type and dosimety of microparticle treatment needed from a prescription for said patient, selecting a type of core from the cores included in said kit, selecting a type of linker from the linkers included in said kit, selecting a radionuclide and preparing said microparticle treatment dose from said instructions or said means for obtaining instructions.

68. The method of claim 60, wherein said microparticle treatment dose is made said kit at a location of administration or at a site proximate to the location of administration.

69. The method of claim 60, wherein said location or said site is a local radiopharmacy, laboratory, hospital or physician's office.

70. The method of claim 60, wherein said microparticle treatment dose are made said kit at a location of administration or at a site proximate to the location of administration.

71. The method of claim 60, wherein said location or said site is a local radiopharmacy, laboratory, hospital or physician's office.

72. A microparticle comprising a core, and at least two radioactive therapeutic agents attached to said core.

73. The particle of claim 72, wherein said at least two radioactive therapeutic agents are independently selected from the group consisting of a therapeutic radionuclide and an imaging or diagnostic radionuclide.

74. The particle of claim 72, wherein at least one of said at least two radioactive therapeutic agents is a beta-emitting radionuclide and at least one of said at least two radioactive therapeutic agents is a gamma-emitting radionuclide.

75. The particle of claim 74, wherein said beta-emitting radionuclide is a therapeutic radionuclide and said gamma-emitting radionuclide is an imaging or diagnostic radionuclide.

76. The particle of claim 75, wherein said therapeutic radionuclide is yttrium-90 and said an imaging or diagnostic radionuclide is selected from the group consisting of indium-111 and Tc-99m.

77. The particle of claim 72, wherein said core is non-ceramic and non-radioactively labeled.

78. The particle of claim 72, wherein said core comprises a polymer selected from the group consisting of polyacrylate, ethylene-vinyl acetate polymer, an acyl substituted cellulose acetate, polyurethane, polystyrene, polyvinylchloride, polyvinyl flouride, poly(vinyl imidazole), chlorosulphonate polyolefin, **polyethylene** oxide, blends thereof, and copolymers thereof, a polyphosphazine, a poly(vinyl

alcohol), a polyamide, a polycarbonate, a polyalkylene, a polyacrylamide, a polyalkylene glycol, a polyalkylene oxide, a polyalkylene terephthalate, a polyvinyl ether, a polyvinyl ester, a polyvinyl halide, polyvinylpyrrolidone, a polyglycolide, a polysiloxane, and copolymers thereof, a alkyl cellulose, an hydroxyalkyl cellulose, a cellulose ether, a cellulose ester, and a nitrocellulose.

79. The particle of claim 72, wherein said at least two radioactive therapeutic agents are each attached to said core through a covalent bond.

80. The particle of claim 72, wherein said particle does not leach radionuclide.

81. The particle of claim 72, wherein said at least two radioactive therapeutic agents are independently selected from the group consisting of an alpha-emitting radionuclide, a beta-emitting radionuclide and a gamma-emitting radionuclide.

82. A method of radiation therapy of a patient, which comprises administering to the patient microparticles, wherein said microparticles comprise the microparticle as claimed in claim 72.

83. The method of radiation therapy of a patient of claim 82, comprising radiation treatment and imaging or diagnosing.

84. The method of radiation therapy of a patient of claim 82, further comprising assaying the gamma radiation to determine the location of the microparticles in the patient.

85. The particle of claim 1, wherein said microparticle has a diameter in the range of from 8 to 100.

86. The particle of claim 1, wherein said microparticle has a diameter in the range of from 20 to 30.

L10 ANSWER 5 OF 19 USPATFULL on STN
AN 2004:127643 USPATFULL
TI Dental and medical polymer composites and compositions
IN Vallittu, Pekka, Kuusisto, FINLAND
Lassila, Lippo, Turku, FINLAND
Skrifvas, Mikael, Piltea, SWEDEN
Viljanen, Eeva, Turku, FINLAND
Ylu-Urpo, Antti, Littoinen, FINLAND
PI US 2004097627 A1 20040520
AI US 2004-467080 A1 20040107 (10)
WO 2002-FI87 20020206
PRAI FI 2001-222 20010206
DT Utility
FS APPLICATION
LREP YOUNG & THOMPSON, 745 SOUTH 23RD STREET 2ND FLOOR, ARLINGTON, VA, 22202
CLMN Number of Claims: 19
ECL Exemplary Claim: 1
DRWN 1 Drawing Page(s)
LN.CNT 716
CAS INDEXING IS AVAILABLE FOR THIS PATENT.
AB The invention relates to polymerizable multifunctional polymer composites and compositions, which are suitable for dental and medical applications, such as dental prostheses, filling materials, implants and the like. It also relates to a method for the manufacture of such polymerizable multifunctional polymer composites and compositions, and to the use of the multifunctional polymer composites and compositions in dental and medical applications. A multifunctional polymer composite or composition is manufactured from 30-99 wt % of a monomer mixture containing 30-99 wt % of a dendrimer or a combination of dendrimers and 1-70 wt % of a reactive solvent or a combination of reactive solvents, and 0.1-70 wt % of a nanofiller or a combination of nanofillers.

CLM What is claimed is:

1. A polymerisable multifunctional polymer composite or composition, characterized in that it comprises a) 30-99 wt % monomers comprising 30-99 wt % of a **dendrimer** or a combination of **dendrimers** and 1-70 wt % of a reactive solvent or a combination of reactive solvents, and b) 0.1-70 wt % of a nanofiller or a combination of nanofillers, and the nanofiller is an organic nanofiller, an inorganic nanofiller or organic-inorganic-hybrid nanofiller, incorporated into the composition or composite with the reactive solvent and forming a nanofiller phase in polymerisation.

2. A polymerisable multifunctional polymer composite or composition according to claim 1, characterized in that it comprises a) 30-99 wt % monomers comprising 50-90 wt % of a **dendrimer** or a combination of **dendrimers** and 1-50 wt % of a reactive solvent or a combination of reactive solvents, and b) 30-70 wt % of a nanofiller or a combination of nanofillers.

3. A polymerisable multifunctional polymer composite or composition according to claim 1 or 2, characterized in that it comprises a) 30-99 wt % monomers comprising 60-80 wt % of a **dendrimer** or a combination of **dendrimers** and 1-30 wt % of a reactive solvent or a combination of reactive solvents, and b) 50-70 wt % of a nanofiller or a combination of nanofillers.

4. A polymerisable multifunctional polymer composite or composition according to any one of claims 1-3, characterized in that the nanofiller is a solid powder with a particle size of less than 0.1 μm.

5. A polymerizable multifunctional polymer composite or composition according to any one of claims 1-4, characterized in that the organic nanofiller is selected from a group consisting of a polymer chain, a cluster of polymer chains, a co-polymer of said polymers and preferably from polymerized alkyl acrylate and/or alkyl methacrylate, alkyl dimethacrylates, and alkyl diacrylates monomers, the inorganic nanofiller is selected from a group consisting of particles of aluminium oxide, silicates, glass fillers, ceramic materials, silica gel (Si-gel) and titanium gel (Ti-gel), and the inorganic-organic hybrid filler is selected from the group consisting of polysilsesquioxanes.

6. A polymerizable multifunctional polymer composite or composition according to anyone of claims 1-5, characterized in that the organic nanofiller is a cluster of polymer chains of polymethyl methacrylate (PMMA) or a cluster of polymer chains of polyethyleneglykol dimethacrylate (PEG DMA) and the inorganic nanofiller is a quartz or barium glass filler.

7. A multifunctional polymer composite or composition according to any one of claims 1-6, characterized in that the reactive solvent is an acrylate or methacrylate monomer.

8. A multifunctional polymer composite or composition according to any one of claims 1-7, characterized in that the reactive solvent is methyl methacrylate, ethyl methacrylate, butyl methacrylate or propyl methacrylate.

9. A multifunctional polymer composite or composition according to any one of claims 1-8, characterized in that the **dendrimer** is selected from the group consisting of **dendrimers** with allylic, vinylic, acrylic or methacrylic groups as **terminal** groups.

10. A multifunctional polymer composite or composition according to any one of claims 1-9, characterized in that the **dendrimer** is a methacrylate terminated **dendrimer**.

11. A multifunctional polymer composite or composition according to any one of claims 1-10, characterized in that the composite or composition comprises reinforcement, preferably glass fibre, carbon/graphite fibre

or **polyethylene** fibre, plasticizers, antioxidants, drug substances, anti-microbiological agents, colourants, polymerization initiators and catalysts.

12. A method for the manufacture of a polymerisable multifunctional polymer composite or composition, characterized in that a monomer mixture is prepared wherein 30-99 wt % of a **dendrimer**(s) is mixed with 1-70 wt % of a reactive solvent(s), to 30-99 wt % of the obtained mixture 0.1-70 wt % of a nanofiller(s), which is an organic nanofiller, an inorganic nanofiller or organic-inorganic-hybrid nanofiller, forming a nanofiller phase in polymerisation, is added and the components are mixed at 20-50° C. temperature, 0.1-3 wt % of a polymerisation initiator, an optional catalyst, each, and optional additives are added.

13. A method according to claim 12 for the manufacture of a polymerisable multifunctional polymer composite or composition, characterized in that 50-90 wt % of a **dendrimer**(s) is mixed with 1-50 wt % of a reactive solvent(s), to the obtained mixture 30-70 wt % of a nanofiller(s) is added.

14. A method according to claim 12 or 13 for the manufacture of a polymerisable multifunctional polymer composite or composition, characterized in that 60-80 wt % of a **dendrimer**(s) is mixed with 1-30 wt % of a reactive solvent(s), to the obtained mixture 50-70 wt % of a nanofiller(s) is added.

15. A method according to any one of claims 12-14 for the manufacture of a polymerisable multifunctional polymer composite or composition, characterized in that the nanofiller is a solid powder with a particle size of less than 0.1 μm.

16. A method according to any one of claims 12-15 for the manufacture of a polymerisable multifunctional polymer composite or composition, characterized in that the organic nanofiller is selected from a group consisting of a polymer chain, a cluster of polymer chains, a co-polymer of said polymers and preferably from polymerized alkyl acrylate and/or alkyl methacrylate, alkyl dimethacrylates, and alkyl diacrylates monomers, the inorganic nanofiller is selected from a group consisting of particles of aluminium oxide, silicates, glass fillers, ceramic materials, silica gel (Si-gel) and titanium gel (Ti-gel), and the inorganic-organic hybrid filler is selected from the group consisting of polysilsesquioxanes.

17. A method according to any one of claims 12-16 for the manufacture of a polymerisable multifunctional polymer composite or composition, characterized in that the organic nanofiller is a cluster of polymer chains of polymethyl methacrylate (PMMA) or a cluster of polymer chains of polyethyleneglykol dimethacrylate (PEG DMA) and the inorganic nanofiller is a quartz or barium glass filler.

18. A method according to any one of claims 12-17 for the manufacture of a polymerisable multifunctional polymer composite or composition, characterized in that the reactive solvent is an acrylate or methacrylate monomer.

19. A method according to any one of claims 12-18 for the manufacture of a polymerisable multifunctional polymer composite or composition, characterized in that the reactive solvent is methyl methacrylate, ethyl methacrylate, butyl methacrylate or propyl methacrylate.

L10 ANSWER 6 OF 19 USPATFULL on STN
AN 2004:82749 USPATFULL
TI Biological component comprising artificial membrane
IN Chaikof, Elliot, Atlanta, GA, UNITED STATES
Feng, June, Duluth, GA, UNITED STATES
Orban, Janine M., Pittsburgh, PA, UNITED STATES

Liu, Hongbo, Hillsborough, NJ, UNITED STATES
Sun, Xue Long, Atlanta, GA, UNITED STATES
Faucher, Keith M., Athens, GA, UNITED STATES
PI US 2004063200 A1 20040401
AI US 2003-343408 A1 20030722 (10)
WO 2001-US24020 20010730
DT Utility
FS APPLICATION
LREP GREENLEE WINNER AND SULLIVAN P C, 5370 MANHATTAN CIRCLE, SUITE 201, BOULDER, CO, 80303
CLMN Number of Claims: 82
ECL Exemplary Claim: 1
DRWN 19 Drawing Page(s)
LN.CNT 3409
CAS INDEXING IS AVAILABLE FOR THIS PATENT.
AB A biocompatible biological component is provided comprising a membrane-mimetic surface film covering a substrate. Suitable substrates include hydrated substrates, e.g. hydrogels which may contain drugs for delivery to a patient through the membrane-mimetic film, or may be made up of cells, such as islet cells, for transplantation. The surface may present exposed bioactive molecules or moieties for binding to target molecules in vivo, for modulating host response when implanted into a patient (e.g. the surface may be antithrombogenic or antiinflammatory) and the surface may have pores of selected sizes to facilitate transport of substances therethrough. An optional hydrophilic cushion or spacer between the substrate and the membrane-mimetic surface allows transmembrane proteins to extend from the surface through the hydrophilic cushion, mimicking the structure of naturally-occurring cells. An alkylated layer directly beneath the membrane-mimetic surface facilates bonding of the surface to the remainder of the biological component. Alkyl chains may extend entirely through the hydrophilic cushion when present. To facilitate binding, the substrate may optionally be treated with a polyelectrolyte or alternating layers of oppositely-charged polyelectrolytes to facilitate charged binding of the membrane-mimetic film or alkylated layer beneath the membrane-mimetic film to the substrate. The membrane-mimetic film is preferably made by in situ polymerization of phospholipid vesicles.
CLM What is claimed is:

1. A biological component comprising an artificial membrane and a substrate.

2. The biological component of claim 1 wherein the artificial membrane comprising a phospholipid membrane-mimetic surface.

3. The biological component of claim 2 wherein said phospholipid is selected from the group consisting of phosphatidylcholine, phosphatidylethanolamine, phosphatidylglycerol, ether-based phospholipids, lipopeptide conjugates, and glycolipid conjugates.

4. The biological component of claim 1 wherein said substrate is selected from the group consisting of implantable prostheses, artificial organs, cells, drug delivery device, or therapeutic devices.

5. The biological component of claim 1 wherein said substrate is a hydrogel.

6. The biological component of claim 1 wherein said substrate is selected from the group consisting of gelatin, collagen, alginate, and chitosan and comprises a bioactive substance.

7. The biological component of claim 6 wherein said substrate is an alginate comprising a bioactive substance.

8. The biological component of claim 1 wherein said substrate is a cell selected from the group consisting of islet cells, hepatocytes, parathyroid cells, thyroid cells neurons, sertoli cells, and genetically engineered cells designed to secrete bioactive compounds.

9. The biological component of claim 1 wherein said membrane-mimetic surface comprises pores of a selected size.

10. The biological component of claim 1 wherein said membrane-mimetic surface has been functionalized to modulate interactions between a cell, tissue, blood, organ or other living material and said membrane surface, or the substrate on which said membrane or surface has been placed.

11. The biological component of claim 9 where such modulated interactions are selected from the group consisting of reduction of thrombogenicity, reduction of inflammatory response, selective transport of molecules through said membrane, and sequestering of particles from the host into which the biological component has been placed.

12. The biological component of claim 1 wherein a polyelectrolyte is completed onto said substrate, and said membrane-mimetic surface is attached thereto.

13. The biological component of claim 1 comprising a hydrophilic polymer cushion between said substrate and said membrane-mimetic surface.

14. The biological component of claim 13 also comprising a polyelectrolyte complexed onto said substrate.

15. A biological component comprising a hydrated substrate coated with a stable, alkylated surface by the steps of: complexing a polyelectrolyte onto the hydrated substrate, and coating the surface of the polyelectrolyte with an oppositely charged amphiphilic polymer containing long-chain alkanes.

16. The biological component of claim 15 wherein a membrane-mimetic surface is formed on the alkylated surface.

17. The biological component of claim 15 wherein said substrate comprises one or more materials selected from the group consisting of cells, and natural or synthetic polysaccharides and proteins which complex with a polyelectrolyte.

18. The biological component of claim 17 wherein said material comprises a natural or synthetic collagen, gelatin, alginate, recombinant collagen protein or protein-mimetic polypeptide polymer.

19. The biological component of claim 15 wherein said hydrated substrate comprises a bioactive molecule.

20. The biological component of claim 19 wherein said bioactive molecule enhances cell viability or function, or minimizes local host inflammatory responses.

21. The biological component of claim 15 wherein said hydrated substrate is comprised within openings in a device for implantation into a patient.

22. The biological component of claim 15 wherein said hydrated substrate is coated onto a surface of a device for implantation into a patient.

23. The biological component of claim 22 wherein said device is selected from the group consisting of dialysis tubing, dialysis membranes, hollow fibers, membrane oxygenators, artificial blood vessels, artificial heart valves, left ventricular assist devices, artificial hearts, artificial lungs, artificial kidneys, artificial livers, vascular grafts, artificial heart valves, artificial joints, catheters, synthetic and intraocular lenses, electrodes, artificial cartilage, ligaments, tendons, bones and bone grafts, tissue reinforcements, tissue scaffolds including tissue scaffolds comprising cells and/or tissues, cell-containing capsules, intraluminal stents for use within blood vessels, biliary system or hollow organs.

24. The biological component of claim 15 wherein said hydrated substance is coated onto the lumenal surface of a porous or nonporous conduit.

25. The biological component of claim 15 wherein said polyelectrolyte is alginate or poly-L-lysine.

26. The biological component of claim 15 wherein alternating layers of oppositely-charged polyelectrolytes are complexed onto said hydrated substrate.

27. The biological component of claim 16 wherein said membrane-mimetic surface comprises a phospholipid.

28. The biological component of claim 16 wherein said phospholipid is selected from the group consisting of phosphatidylcholine, phosphatidylethanolamine, phosphatidylglycerol, ether-based phospholipids, lipopeptide conjugates, and glycolipid conjugates.

29. The biological component of claim 28 wherein said ether-based phospholipids are selected from the group consisting of dialkyl (C10-C20) ether-linked phospholipid, mono and dialkenyl (C10-C20) ether-linked phospholipid.

30. The biological component of claim 28 wherein said lipopeptide conjugates are selected from the group consisting of biologically active synthetic, recombinant, or native peptides conjugated to a lipid group.

31. The biological component of claim 28 wherein said glycolipid conjugates are selected from the group consisting of synthetic or native oligosaccharides, polysaccharides, glycosaminoglycans, including derivatives of heparan sulfate, chondroitin sulfate, dermatan sulfate, keratan sulfate, and hyaluronan conjugated to a lipid group.

32. The biological component of claim 27 wherein said phospholipid is selected from the group consisting of acryloyloxy, methacryloyl, dienoyl sorbyl, acrylide, acrylonitrile, N-vinyl pyrrolidone, mono-acrylates, bis-acrylates, mono-dienes, bis-dienes, mono-diacetylene, bis-acetylene, mono-styryl groups, bis-styryl groups, mono-thiols, bis-thiols, mono-disulfides, and bis-disulfides.

33. The biological component of claim 27 wherein said phospholipid contains at least one polymerizable group.

34. The biological component of claim 27 wherein said phospholipid contains only one polymerizable group.

35. The biological component of claim 27 wherein said phospholipid comprises a mixture of polymerizable and non-polymerizable phospholipids whereby non-polymerized domains comprise membrane bound receptors.

36. The biological component of claim 16 wherein said membrane-mimetic surface comprises a polymerized phosphatidylcholine phospholipid.

37. The biological component of claim 16 wherein said membrane-mimetic surface is formed by in situ polymerization of a phospholipid on said alkylated surface.

38. The biological component of claim 37 wherein said polymerization is performed by fusion of said phospholipid followed by photopolymerization.

39. The biological component of claim 16 wherein said membrane-mimetic surface is formed by photocrosslinking of lipid molecules to functionalities on said alkylated surface.

40. The biological component of claim 16 comprising between said membrane-mimetic surface and said substrate a synthetic self-assembling amphiphile selected from the group consisting of polymers comprising an

anchoring component and a hydrophilic spacer component.

41. The biological component of claim 40 wherein said self-assembling amphiphile also comprises a self-assembling hydrophobic component.

42. The biological component of claim 41 wherein said self-assembling amphiphile comprises a terpolymer comprised of: a) an anchoring group which is a saturated or unsaturated single long chain alkane with optional **terminal** functionalities to facilitate crosslinking reactions with the supported lipid assembly; b) a hydrophilic spacer which is a saturated or unsaturated group with two or more long chain alkane units with optional **terminal** functionalities to facilitate crosslinking reactions with the supported lipid assembly; and c) a self-assembling hydrophobic component which is a saturated or unsaturated, symmetric or asymmetric boloamphiphile with one or more long chain alkane with optional **terminal** Tonalities to facilitate functionalization of the membrane-mimetic surface with bioactive molecules.

43. The biological component of claim 41 wherein said self-assembling amphiphile comprises a terpolymer comprising 2-hydroxymethyl acrylate (HEA), 3-acryloyl-3-oxapropyl-3-(N,N-dioctadecylcarbamoyl)-propionate (AOD), and styrene sulfonate in a molar ratio of 6:3:1.

44. The biological component of claim 43 wherein said substrate is alginate coated with poly-L-lysine.

45. The biological component of claim 41 wherein said amphiphile comprises a copolymer comprising of 2-hydroxymethyl acrylate (HEA) and 3-acryloyl-3-oxapropyl-3-(N,N-dioctadecylcarbamoyl)-propionate (AOD) in a 1:1 molar ratio.

46. The biological component of claim 45 wherein said copolymer is applied directly to an alginate substrate.

47. The biological component of claim 2 wherein said membrane-mimetic surface comprises a polymerized phosphatidylcholine phospholipid.

48. The biological component of claim 16 wherein said membrane-mimetic surface comprises pores of a selected size.

49. The biological component of claim 34 wherein said pores are of a size selected from the group consisting of about 20 to 50 Å, 50 to 100 Å, 20 to 50 Å and 100 to 250 Å, plus or minus about ten percent.

50. The biological component of claim 16 wherein an antithrombogenic membrane-mimetic surface is formed by incorporating an antithrombogenic moiety into said surface in an amount sufficient to minimize thrombogenesis.

51. The biological component of claim 16 wherein said antithrombogenic moiety is a moiety of an antithrombotic, antiplatelet, or profibrinolytic agent.

52. The biological component of claim 51 wherein said antithrombogenic moiety is comprised in a molecule selected from the group consisting of thrombomodulin, endothelial cell protein C receptor, vascular ATP diphosphohydrolase, hirudin, and lysine.

53. The biological component of claim 51 wherein said antithrombogenic moiety is added to a phospholipid prior to polymerization in situ.

54. The biological component of claim 51 wherein a lipid-modified thrombomodulin mutant is added to said phospholipid.

55. The biological component of claim 54 wherein said antithrombogenic moiety comprises extracytoplasmic domains of thrombomodulin.

56. The biological component of claim 54 wherein said lipid-modified thrombomodulin mutant is selected from the group consisting of a thrombomodulin fragment generated enzymatically, synthetically, or by recombinant methods, containing any or all of the extracellular domain which includes EGF repeats 4-6.

57. A biological component comprising a membrane-mimetic surface of claim 16 designed to minimize a host inflammatory response comprising a neoglycocalyx formed on said membrane-mimetic surface using a synthetic or natural glycosaminoglycan.

58. The biological component of claim 57 wherein said synthetic or natural glycosaminoglycan is selected from the group consisting of heparin, heparan sulfate, chondroitin sulfate, dermatan sulfate, keratan sulfate, and hyaluronan and anti inflammatory analogs thereof linked to said membrane-mimetic surface in an amount effective to minimize a host inflammatory response.

59. The biological component of claim 58 wherein said amount of surface area coverage of between about 10 and about 100%.

60. The biological component comprising a membrane-mimetic surface of claim 16 designed to minimize a host inflammatory response comprising a synthetic hydrophilic polymer selected from the group consisting of **polyethylene** oxide, polyacrylamide, poly(hydroxymethyl acrylate) (poly(HEA)), poly(hydroxymethyl methacrylate) (poly(HEMA)), and poly(vinylpyrollidone) linked to said membrane-mimetic surface in an amount effective to minimize a host inflammatory response.

61. The biological component of claim 16 wherein said membrane-mimetic surface comprises a targeting moiety linked thereto.

62. The biological component of claim 61 wherein said targeting moiety is selected from the group consisting of Avidin, Streptavidin, thiol-containing proteins, polypeptides, peptides, polysaccharides, lectin, enzymes and antibodies.

63. A method of forming an alkylated surface on a hydrated substrate comprising: complexing polyelectrolyte onto the hydrated substrate, and coating the surface of the polyelectrolyte with an oppositely charged amphiphilic polymer containing long-chain alkanes.

64. A method of forming biological component comprising polymerizing a membrane-mimetic lipid onto the amphiphilic polymer of claim 63.

65. The method of claim 65 comprising forming pores in said membrane-mimetic surface.

66. The method of claim 65 comprising incorporating particles selected from the group consisting of albumin, nanospheres and **dendrimers** , of a selected size and shape, into said membrane-mimetic surface.

67. The method of claim 66 wherein each arm of said **dendrimers** is terminated with a moiety that can be linked to said biological component.

68. The method of claim 67 wherein said moiety is covalently linked to said biological component.

69. The method of claim 67 wherein said moiety is non-covalently linked to said biological component.

70. The method of claim 67 wherein said moiety is linked to said membrane-mimetic surface.

71. The method of claim 67 wherein said moiety is linked to said biological component beneath said membrane-mimetic surface.

72. The method of claim 66 wherein said particles are **dendrimers** selected from the group consisting of **polyethylene** oxide, polyacrylamide, poly(hydroxymethyl acrylate) (poly(HEA)), poly(hydroxymethyl methacrylate) (poly(HEMA)), poly(vinylpyrollidone), polyacrylic acid, polystyrene and block copolymers thereof.

73. The method of claim 66 wherein pores are formed in said membrane-mimetic surface by insertion of natural or artificial pores.

74. The method of claim 65 wherein pores are formed in said membrane-mimetic surface by insertion of artificial or natural transporter molecules.

75. A biological component comprising a hydrated substrate with a membrane-mimetic surface, said surface being formed by the steps of: complexing a polyelectrolyte onto the hydrated substrate, and then coating the surface of the polyelectrolyte with an oppositely charged amphiphilic polymer derivatized with a compound selected from the group consisting of phosphatidylcholine, phosphatidylethanolamine, phosphatidylglycerol, and lipid-like boloamphiphiles.

76. The biological component of claim 75 wherein said polyelectrolyte is selected from the group consisting of alginate and poly-L-lysine.

77. A method for delivering a drug comprising incorporating said drug into a biological component of claim 1.

78. The method of claim 77 wherein said drug is incorporated into said substrate.

79. A method of minimizing or abrogating a host inflammatory response to an implanted substrate of claim 1 comprising: incorporating into the artificial membrane of claim 1 a moiety having anti-inflammatory effect.

80. The method of claim 77 wherein said moiety is that of a molecule selected from the group consisting of thrombomodulin, endothelial cell protein C receptor, vascular ATP diphosphohydrolase, hirudin, annexin, HLA-G, IL-10, hyaluronan, heparan sulfate, heparin, chondroitin sulfate, keratan sulfate, dermatan sulfate and anti-inflammatory analogs of the foregoing.

81. The method of claim 77 wherein said anti-inflammatory moiety is incorporated into said membrane-mimetic surface.

82. The method of claim 77 wherein said substrate is selected from the group consisting of islet cells, hepatocytes, parathyroid cells, thyroid cells, neurons, sertoli cells and genetically engineered cells designed to secrete bioactive compounds.

L10 ANSWER 7 OF 19 USPATFULL on STN
AN 2004:77074 USPATFULL
TI Multivalent neuraminidase inhibitor conjugates
IN Wu, Wen-Yang, Mount Waverly, AUSTRALIA
Dowle, Michael Dennis, Stevenage, UNITED KINGDOM
Jin, Betty, Mount Waverley, AUSTRALIA
Macdonald, Simon John Fawcett, Stevenage, UNITED KINGDOM
Mason, Andrew McMurtrie, Stevenage, UNITED KINGDOM
McConnell, Darryl, Wien, AUSTRIA
Watson, Keith, Surrey Hills, AUSTRALIA
PI US 2004058853 A1 20040325
AI US 2003-363988 A1 20031014 (10)
WO 2001-AU1128 20010907
PRAI AU 2000-10 20000908
DT Utility
FS APPLICATION
LREP FOLEY AND LARDNER, SUITE 500, 3000 K STREET NW, WASHINGTON, DC, 20007

CLMN Number of Claims: 45
ECL Exemplary Claim: 1
DRWN No Drawings
LN.CNT 1759
CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB The invention relates to a multimeric compound or a pharmaceutically acceptable salt or derivative thereof which comprises three or more neuraminidase-binding groups attached to a spacer or linking group, in which the neuraminidase-binding group is a compound which binds to the active site of influenza virus neuraminidase, but is not cleaved by the neuraminidase. The invention also relates to processes for the preparation of the multimeric compound defined above, pharmaceutical compositions containing them or methods for the treatment and/or prophylaxis of a viral infection involving them.

CLM What is claimed is:

1. A multimeric compound or a pharmaceutically acceptable salt or derivative thereof which comprises three or more neuraminidase-binding groups attached to a spacer or linking group, in which the neuraminidase-binding group is a compound which binds to the active site of influenza virus neuraminidase, but is not cleaved by the neuraminidase.

2. A compound according to claim 1, in which the neuraminidase-binding group has an IC.sub.50 of about 10.sup.-6M or more.

3. A compound according to claim 1 or claim 2, which comprises three or more neuraminidase-binding neuraminic acid (sialic acid) derivatives or cyclopentyl or cyclohexenyl carboxylic acid derivatives covalently attached to a common backbone group comprising a core or both a core and a spacer.

4. A compound according to any one of claims 1 to 3 which is a **dendrimer** having **terminal** groups which are neuraminidase-binding groups.

5. A compound according to claim 4, in which the **dendrimer** is a polyamidoamine (PAMAM) **dendrimer** or a polylysine **dendrimer**.

6. A compound according to any one of claims 1 to 5 which is of the formula (I): ##STR60## in which: X is O or CH; R is an azido group, a hydroxy group, an optionally substituted guanidino group, an optionally substituted amino group, an optionally substituted amidine, or an optionally substituted imidate; R.sup.2 is COCR.sup.3.sub.3 or SO.sub.2CR.sup.3.sub.3; R.sup.3 is independently selected from H, F, Cl, Br, I and C.sub.1-6alkyl; n is an integer of from 2 to 128; Y is --O, --O(C.dbd.O), --NR.sup.4, --NR.sup.4CO, --O(C.dbd.O)NR.sup.4, --O(C.dbd.S)NR.sup.4, --NR.sup.4(C.dbd.O)O, --NR.sup.4(C.dbd.S)O, --NR.sup.4(C.dbd.O)NR.sup.4, --NR.sup.4(C.dbd.S)NR.sup.4, --NR.sup.4SO, --NR.sup.4SO.sub.2, --NR.sup.4SONR.sup.4, or --NR.sup.4SO.sub.2NR.sup.4 in which R.sup.4 is H or C.sub.1-6alkyl; CG is a core group selected from an optionally substituted cyclic, straight or branched group or a combination thereof having from 1 to 200 atoms in its backbone, in which the backbone atoms are selected from C, N, O and S; and L is a linking group of from 0 to 20 backbone atoms, in which the backbone and **terminal** atoms are selected from C, N, O and S; or a pharmaceutically acceptable derivative thereof and/or an isomer thereof.

7. A compound according to claim 6, in which X is O; R is an optionally substituted amino or guanidino group; R.sup.3 is H, F or C.sub.1-6alkyl; n is an integer from 2 to 7; Y is --O or --O(C.dbd.O)NR.sup.4, in which R.sup.4 is H and the group is bonded to the linking group L through the N atom; and L is a linking group of from 1 to 15 backbone atoms.

8. A compound according to claim 7, in which R is an

8. A compound according to claim 7, in which R is an unsubstituted amino

or guanidino group; n is 2 or 3; Y is --O(C+O)NR.sup.4 in which R.sup.4 is H and the group is bonded to the linking group L through the N atom; and L is --HN(CH.sub.2)p in which p is an integer from 2 to 10.

9. A compound according to any one of claims 6 to 8 which is a 7-carbamate derivative.

10. A compound according to claim 9 in which R is guanidine, R.sup.2 is acetyl, X is O, Y is --O(C.dbd.O)NH and n is 2 to 7.

11. A compound according to any one of claims 6 to 9 in which CG is selected from one or more of optionally substituted straight or branched hydrocarbon chains optionally containing heteroatoms selected from N, O or S, peptides, oligosaccharides, cyclodextrins, polyamidoamines, polyethylenimines, polyalkyl and polyaryl ethers, polyamidoalcohols, calixarenes, polyaminoacids, **polyethylene** glycol units, alkylamidoalkanes, oligolactates, oligoglycolates, ethylenediamine tetraacetic acid (EDTA), aryl, cycloalkyl, heterocyclic rings and heteroaryl groups in which the heteroatoms are selected from N, S, and O.

12. A compound according to claim 11, in which CG is selected from one or more of optionally substituted straight or branched hydrocarbon groups optionally comprising heteroatoms selected from N, O and S, peptides, polyamidoamines, EDTA, **polyethylene** glycol units, calixarenes, aryl, cycloalkyl, heterocyclic and heteroaryl groups.

13. A compound according to claim 11 or claim 12, in which CG is selected from one or more of optionally substituted straight or branched hydrocarbon groups, optionally comprising heteroatoms selected from N, O and S, EDTA, aryl, cycloalkyl, heterocyclic and heteroaryl groups.

14. A compound according to any one of claims 6 to 13, in which the core group CG, linking group L, and/or group Y are selected to impart longer-lasting lung residence properties to the compounds of formula (I).

15. A compound according to claim 6, in which CG is of the formula (II) ##STR61## in which W is independently selected from OH, N(R.sup.4).sub.2 or -L-Y--B, in which R.sup.4 is defined in claim 6; x is an integer from 1 to 10; m is an integer from 1 to 4; R.sup.5 is a cyclic group selected from aryl, heteroaryl, cyclic C.sub.1-10 alkyl, or heterocylic C.sub.1-.sub.10 alkyl, or an optionally substituted C.sub.1-10 alkyl, C.sub.3-10 alkenyl or C.sub.3-10alkynyl where one or more of the C atoms in the chain can optionally be replaced by a heteroatom selected from N, O and S or a combination thereof; L is as defined in claim 6; Y is as defined in claim 6; B is H or a compound of formula (B): ##STR62## in which X, R and R.sup.2 are as defined in claim 6; with the provisos that: B cannot be H when Y is --NH(C.dbd.O)O or --NH(C.dbd.S)O; not more than one W can be OH or N(R.sup.3).sub.2 and not more than one B can be H, and W cannot be OH N(R.sup.3).sub.2 when B is H; or a pharmaceutically acceptable derivative thereof and/or isomer thereof.

16. A compound according to claim 6, which is of the formula (III) ##STR63## in which CG, L, Y, X, R and R.sup.2 are as defined in claim 6.

17. A compound according to any one of the preceding claims, in which the molecular weight is about 1,000 to about 100,000.

18. A compound according to claim 17, in which the molecular weight is about 1,000 to about 10,000.

19. A compound according to claim 17 or claim 18, in which the molecular weight is about 1,000 to about 5,000.

20. A process for the preparation of a compound of formula (I) as defined in claim 6, which comprises coupling a compound of formula (IV);

##STR64## in which Y* is CO.sub.2H, --COLG, NCO, -halide, --OH, --NR.sup.3COLG, --OCOLG, --OCSLG, SO.sub.2LG, NR.sup.3SO.sub.2LG, NR.sup.3CSLG, epoxides, or Michael acceptors; and LG is a leaving group or a protected derivative thereof; with a compound of formula (V); ##STR65## in which Y** is NHR.sup.3 or OH or an activated or protected derivative thereof, optionally followed by deprotection if necessary.

21. A process for the preparation of a compound of formula (I) as defined in claim 6 which comprises reacting a compound of formula (VI); ##STR66## in which L* is L-NHR.sup.3, L-OH, L-CO.sub.2H, or a protected derivative thereof, with a compound of formula (VII) ##STR67## wherein Y*** is D-AG or halogen; D is O or NR.sup.3; AG is COLG, . . . , CSLG or SO.sub.2LG; and LG is a leaving group or a protected derivative thereof.

22. A process for the preparation of a compound of formula (II) as defined in claim 15 which comprises coupling a compound of general formula (VIII) ##STR68## or a protected derivative thereof, with a compound of formula B--Y-L-H, or a protected derivative thereof, wherein B, Y, and L are as defined in claim 15 and the atom in L bonded to H is a heteroatom; optionally followed by deprotection if necessary.

23. A process for the preparation of a compound of formula (II) as defined in claim 15 which comprises coupling a compound of formula (V) as defined in claim 20 or a protected derivative thereof with a compound of formula (XI) ##STR69## in which Y* and L are as defined in claim 20 optionally followed by deprotection if necessary.

24. A process for the preparation of a compound of formula (II) as defined in claim 15 in which the **terminal** atom in L is nitrogen which comprises coupling a compound of formula (XII): ##STR70## or a protected derivative thereof, with a compound of formula (VII) as defined in claim 21, or a protected derivative thereof optionally followed by deprotection if necessary.

25. A process for the preparation of a compound of formula (II) as defined in claim 15 wherein Rs is an optionally substituted alkyl group which comprises a reaction of a compound of formula (XIII): ##STR71## in which W is as defined in claim 15, or a protected derivative thereof, with an optionally substituted alkyl halide optionally followed by deprotection if necessary.

26. A pharmaceutical composition comprising a compound of formula (I) or a pharmaceutically acceptable derivative thereof, together with one or more pharmaceutically acceptable carriers and, optionally at least one other therapeutic and/or prophylactic ingredient.

27. A composition according to claim 26, in which the other therapeutic and/or prophylactic ingredient is an anti-infective agent.

28. A composition according to claim 27, in which the anti-infective agent is an anti-bacterial or anti-viral agent.

29. A composition according to claim 28, in which the anti-viral agent is a sialic acid analogue, amantadine, rimantadine and/or ribavirin.

30. A method for the treatment and/or prophylaxis of a viral infection which comprises the step of administration of an effective amount of a compound as defined in any one of claims 1 to 19 to a subject in need thereof.

31. A method according to claim 30 in which the viral infection is an orthomyxovirus or paramyxovirus infection.

32. A method according to claim 30 or claim 31, in which the infection is caused by influenza A or B.

33. A method according to any one of claims 30 to 32, in which the

subject is a mammal.

34. A method according to claim 33, in which the mammal is a human.

35. A method according to any one of claims 30 to 34, in which the amount of compound administered is in the range of from about 0.0001 to about 100 mg/kg of bodyweight per day.

36. A method according to any one of claims 30 to 35, in which the compound is administered to the respiratory tract by inhalation, insufflation or intranasal administration or a combination thereof.

37. A compound according to any one of claims 1 to 19 for use as an active therapeutic agent in the treatment and/or prophylaxis of a viral infection.

38. Use of a compound according to any one of claims 1 to 19 in the manufacture of a medicament for the treatment and/or prophylaxis of a viral infection.

39. A method for the detection of a viral infection which comprises the step of contacting a compound according to any one of claims 1 to 19 with a sample suspected of containing the virus.

40. A method according to claim 39, in which the viral infection is an orthomyxovirus or a paramyxovirus infection.

41. A method according to claim 39, in which the infection is caused by influenza A or B.

42. An inhaler which contains a composition according to any one of claims 26 to 29.

43. An inhaler according to claim 42 which is adapted for oral administration as a free-flow powder.

44. An inhaler according to claim 42 which is a metered dose aerosol inhaler.

L10 ANSWER 8 OF 19 USPATFULL on STN
AN 2004:57000 USPATFULL
TI Polyol-IFN-beta conjugate and composition containing same
IN El-Tayar, Nabil, Milton, MA, UNITED STATES
Roberts, Michael J., Madison, AL, UNITED STATES
Harris, Milton, Huntsville, AL, UNITED STATES
Sawlivich, Wayne, Wilmington, MA, UNITED STATES
PA APPLIED RESEARCH SYSTEMS ARS HOLDING N.V., Curacao, NETHERLANDS (U.S. corporation)
PI US 2004043002 A1 20040304
AI US 2003-649609 A1 20030828 (10)
RLI Division of Ser. No. US 2000-698133, filed on 30 Oct 2000, GRANTED, Pat. No. US 6638500 Continuation of Ser. No. WO 1999-US9161, filed on 28 Apr 1999, PENDING
PRAI US 1998-83339P 19980428 (60)
DT Utility
FS APPLICATION
LREP BROWDY AND NEIMARK, P.L.L.C., 624 NINTH STREET, NW, SUITE 300, WASHINGTON, DC, 20001-5303
CLMN Number of Claims: 22
ECL Exemplary Claim: 1
DRWN 7 Drawing Page(s)
LN.CNT 813
CAS INDEXING IS AVAILABLE FOR THIS PATENT.
AB PEG-IFN-β conjugates, where a PEG moiety is covalently bound to Cys.sup.17 of human IFN-β, are produced by a process of site specific PEGylation with a thiol reactive PEGylating agent. A pharmaceutical composition and a method for treating infections, tumors

and autoimmune and inflammatory diseases are also provided. The invention further relates to a method for the stepwise attachment of PEG moieties in series to a polypeptide, and more particularly to IFN-β.

CLM What is claimed is:

1. A method for treating infections, tumors and autoimmune and inflammatory diseases, comprising administering an effective amount of a polyol-interferon-β conjugate having a polyol moiety covalently bound to Cys.sup.17 of human interferon-β to a subject in need thereof.

2. The method according to claim 1, wherein said polyol moiety is a polyalkylene glycol moiety.

3. The method according to claim 2, wherein said polyalkylene glycol moiety is a **polyethylene** glycol (PEG) moiety.

4. The method according to claim 1, wherein the polyol-interferon-β conjugate has the same or higher interferon-β activity as native human interferon-β.

5. A process for producing a polyol-interferon-β conjugate having a polyol moiety covalently bound to Cys.sup.17 of human interferon-β, comprising: reacting interferon-β with a thiol-reactive polyol agent to site specifically and covalently attach a polyol moiety to Cys.sup.17 of human interferon-β to produce a polyol-interferon-β conjugate; and recovering the produced polyol-interferon-β conjugate.

6. The process according to claim 5, wherein the thiol-reactive polyol agent is a thiol-reactive PEGylating agent.

7. The process according to either claim 5 or claim 6, wherein the thiol-reactive polyol agent is mono-methoxylated.

8. The process according to either claim 5 or claim 6, wherein the thiol-reactive polyol agent is bifunctional.

9. The process according to either claim 5 or claim 6, wherein the thiol-reactive polyol agent is a polyol derivative having a functional group selected from the group consisting of orthopyridyl disulfide, vinyl sulfone, maleimide, and iodoacetimide.

10. The process according to either claim 5 or claim 6, wherein the thiol-reactive polyol agent is an orthopyridyl disulfide derivative of a mono-methoxylated polyol.

11. The process according to claim 5, wherein the reacting step is carried out at an acidic pH where interferon-ss is stable.

12. A method for stepwise attachment of **polyethylene** glycol (PEG) moieties in series to a polypeptide, comprising the steps of: reacting a polypeptide with a low molecular weight heterobifunctional or homobifunctional PEG moiety having the following formula: W--CH.sub.2CH.sub.2O(CH.sub.2CH.sub.2O).sub.nCH.sub.2CH.sub.2--X, where W and X are groups that independently react with an amine, sulfhydryl, carboxyl or hydroxyl functional group to attach the low molecular weight PEG moiety to the polypeptide; and reacting the low molecular weight PEG moiety attached to the polypeptide with a monofunctional or bifunctional PEG moiety to attach the monofunctional or bifunctional PEG moiety to a free terminus of the low molecular weight PEG moiety and form a PEG-polypeptide conjugate.

13. The method according to claim 12, wherein the monofunctional or bifunctional PEG moiety has the following formula: Y--CH.sub.2CH.sub.2O(CH.sub.2CH.sub.2O).sub.mCH.sub.2CH.sub.2--Z, wherein Y is reactive to a **terminal** group on the free terminus of the low molecular weight PEG moiety attached to the polypeptide and Z is

--OCH3 or a group reactive with X to form a bifunctional conjugate.

14. The method according to claim 13, wherein the monofunctional or bifunctional PEG moiety is methoxy PEG, branched PEG, hydrolytically or enzymatically degradable PEG, pendant PEG, or **dendrimer** PEG.

15. The method according to claim 12, wherein W and X are independently selected from the group consisting of orthopyridyl disulfide, maleimides, vinylsulfones, iodoacetamides, hydrazides, aldehydes, succinimidyl esters, epoxides, amines, thiols, carboxyls, active esters, benzotriazole carbonates, p-nitrophenol carbonates, isocyanates, and biotin.

16. The method according to claim 12, wherein the low molecular weight PEG moiety has a molecular weight in a range of about 100 to 5,000 daltons.

17. The method according to claim 12, wherein the monofunctional or bifunctional PEG moiety has a molecular weight in a range of about 100 daltons to 200 kilodaltons.

18. The method according to claim 12, wherein the low molecular weight PEG moiety and/or the monofunctional or bifunctional PEG moiety is a copolymer of **polyethylene** glycol.

19. The method according to claim 18, wherein the copolymer of **polyethylene** glycol is selected from the group consisting of **polyethylene** glycol/polypropylene glycol copolymers and **polyethylene** glycol/poly (lactic/glycolic acid) copolymers.

20. The method according to claim 12, further comprising a step of purifying the PEG-polypeptide conjugate following the stepwise attachment of two PEG moieties in series to a polypeptide.

21. The method according to claim 20, wherein said step of purifying comprises one or more purification techniques selected from the group consisting of ion exchange chromatography, size exclusion chromatography, hydrophobic interaction chromatography, affinity chromatography, and reverse phase chromatography.

22. The method according to claim 12, wherein the polypeptide is interferon-β.

L10 ANSWER 9 OF 19 USPATFULL on STN
AN 2004:28452 USPATFULL
TI Pneumatic tire having a rubber component containing a dendrimer
IN Frank, Uwe Ernst, Marpingen, GERMANY, FEDERAL REPUBLIC OF
Visel, Friedrich, Bofferdange, LUXEMBOURG
Materne, Thierry Florent Edme, Richfield, OH, UNITED STATES
Zimmer, Rene Jean, Howald, LUXEMBOURG
Lauer, Wolfgang, Mersch, LUXEMBOURG
Weydert, Marc, Luxembourg, LUXEMBOURG
Schildbach, Thomas, Eischen, LUXEMBOURG
Lechenbohmer, Annette, Ettelbruck, LUXEMBOURG
Jozef Klinkenberg, Maurice Peter Catharina, Gosseldange, LUXEMBOURG
PA The Goodyear Tire & Rubber Company (non-U.S. corporation)
PI US 2004020576 A1 20040205
AI US 2003-352844 A1 20030128 (10)
RLI Continuation-in-part of Ser. No. US 2001-912208, filed on 24 Jul 2001, ABANDONED
PRAI US 2000-222723P 20000803 (60)
DT Utility
FS APPLICATION
LREP The Goodyear Tire & Rubber Company, Intellectual Property Law Department 823, 1144 East Market Street, Akron, OH, 44316-0001
CLMN Number of Claims: 15
ECL Exemplary Claim: 1

DRWN No Drawings
LN.CNT 868
AB There is disclosed a pneumatic tire having a rubberized component comprising:

(a) 100 parts by weight of at least one rubber containing olefinic unsaturation; and

(b) 1 to 50 phr of a dendrimer.

CLM What is claimed is:

1. A pneumatic tire having a rubber component made from a rubber composition comprising (a) 100 parts by weight of at least one rubber containing olefinic unsaturation; and (b) 1 to 9 phr of a **dendrimer**.

2. The pneumatic tire of claim 1, wherein the rubber composition comprises from 1 to 6 phr of a **dendrimer** made via the polycondensation of cyclic anhydrides with diisopropanolamine.

3. The pneumatic tire of claim 1, wherein the rubber composition comprises from 1 to 5 phr of a **dendrimer** made via the polycondensation of cyclic anhydrides with diisopropanolamine.

4. The pneumatic tire of claim 1, wherein the rubber composition comprises from 5 to 6 phr of a **dendrimer** made via the polycondensation of cyclic anhydrides with diisopropanolamine.

5. The pneumatic tire of claim 1 wherein said **dendrimers** have a functionally active **terminal** moiety selected from the group consisting of carboxyl, vinyl, aryl, aziridenyl, oxazolinyl, haloalkyl, oxiranyl, hydroxy, isocyanato, amine, carboxylic ester moieties, trialkoxysilane, acrylate, methacrylate and **polyethylene** oxide.

6. The pneumatic tire of claim 1 wherein said **dendrimer** is selected from the group consisting of polyamidoamine **dendrimers** , polyether **dendrimers**, polysulfide **dendrimers**, polyaminosulfide **dendrimers**, carbosilane based **dendrimers**, hydrocarbon and polysiloxane **dendrimers**.

7. The pneumatic tire of claim 1 wherein said **dendrimer** is made via the polycondensation of cyclic anhydrides with diisopropanolamine.

8. The pneumatic tire of claim 1 wherein the number of generations range from 2 to 12.

9. The pneumatic tire of claim 1 wherein said rubber is selected from the group consisting of natural rubber, neoprene, polyisoprene, butyl rubber, halobutyl rubber, polybutadiene, styrene-butadiene copolymer, styrene/isoprene/butadiene rubber, methyl methacrylate-butadiene copolymer, isoprene-styrene copolymer, methyl methacrylate-isoprene copolymer, acrylonitrile-isoprene copolymer, acrylonitrile-butadiene copolymer, carboxylated rubber, EPDM, silicon-coupled star-branched polymers, tin-coupled star-branched polymers and mixtures thereof.

10. The pneumatic tire of claim 1 wherein from 0.5 to 20 phr of a sulfur containing organosilicon compound is present and is of the formula: Z-Alk-S.sub.n--Alk-Z in which Z is selected from the group consisting of ##STR3## where R.sup.1 is an alkyl group of 1 to 4 carbon atoms, cyclohexyl or phenyl; R.sup.2 is alkoxy of 1 to 8 carbon atoms, or cycloalkoxy of 5 to 8 carbon atoms; Alk is a divalent hydrocarbon of 1 to 18 carbon atoms and n is an integer of 2 to 8.

11. The pneumatic tire of claim 1 wherein said composition is thermomechanically mixed at a rubber temperature in a range of from 140° C. to 190° C. for a total mixing time of from 1 to 20 minutes.

12. The pneumatic tire of claim 1 wherein said tire is selected from the group consisting of race tires, passenger tires, aircraft tires, agricultural, earthmover, off-the-road and truck tires.

13. The pneumatic tire of claim 1 where said tire is a radial.

14. The pneumatic tire of claim 1 wherein said rubber component is selected from the group consisting of tread, sidewall, apex, chafer, sidewall insert, wirecoat and innerliner.

15. The pneumatic tire of claim 14 wherein said component is a tread.

L10 ANSWER 10 OF 19 USPATFULL on STN
AN 2003:72146 USPATFULL
TI Star-branched polymer with dendrimer core
IN Agarwal, Pawan Kumar, Houston, TX, UNITED STATES
Wang, Hsien-Chang, Bellaire, TX, UNITED STATES
Wang, Yu Feng, Houston, TX, UNITED STATES
Frechet, Jean M. J., Oakland, CA, UNITED STATES
Haque, Shah A., Houston, TX, UNITED STATES
PI US 2003050433 A1 20030313
AI US 2002-278310 A1 20021023 (10)
RLI Division of Ser. No. US 2001-777398, filed on 6 Feb 2001, PENDING
Division of Ser. No. US 1998-100271, filed on 19 Jun 1998, GRANTED, Pat. No. US 6228978
PRAI US 1997-50727P 19970625 (60)
DT Utility
FS APPLICATION
LREP EXXONMOBIL CHEMICAL COMPANY, P O BOX 2149, BAYTOWN, TX, 77522-2149
CLMN Number of Claims: 28
ECL Exemplary Claim: 1
DRWN No Drawings
LN.CNT 575
CAS INDEXING IS AVAILABLE FOR THIS PATENT.
AB Polyisobutylene (PIB) functionalized with terminal reactive unsaturation is disclosed. Carbocationically polymerized monohalogen-terminated PIB is dehydrohalogenated in a hydrocarbon solvent using an alkoxide of the formula RO-M wherein R is alkyl of at least 5 carbon atoms and M is alkali metal. The PIB obtained has terminal unsaturation which is 100% in the reactive `exo` form which can be converted to succinic anhydride groups (PIB-SA) by the ene reaction with maleic anhydride. The PIB-SA is reactive with amine functional dendrimers to obtain a star-branched polymer having a dendrimer core and PIB branches joined by succinimide linkages. Blends of the star-branched polymer with polypropylene have improved energy absorption properties and controllable moisture/oxygen permeabilities useful in films.
CLM What is claimed is:
1. A method for preparing polyisoolefins comprising the steps of: (a) dehydrohalogenating a halogen-terminated polyisoolefin in a hydrocarbon solvent in the presence of alkoxide of the formula RO-M wherein R is alkyl of at least 5 carbon atoms and M is alkali metal; and (b) recovering polyisolefin having **terminal** unsaturation.

2. The method of claim 1 wherein the dehydrohalogenation step (a) obtains polyisobutylene having a **terminal** double bond chain end in `exo` form essentially free of `endo` form.

3. The method of claim 2 wherein the polyisoolefin is monohalogen-terminated.

4. The method of claim 1 wherein the alkoxide is t-pentoxide.

5. The method of claim 4 wherein the alkoxide is potassium t-pentoxide.

6. The method of claim 1 wherein the isoolefin has from 4 to about 12 carbon atoms.

7. The method of claim 6 wherein the isoolefin is isobutylene.

8. Polyisoolefin having a **terminal** double bond chain end in `exo` form essentially free of `endo` form.

9. The polyisoolefin of claim 8 wherein the polyisoolefin comprises polyisobutylene.

10. The polyisoolefin of claim 9 having a molecular weight from 500 to 25 500,000.

11. The polyisoolefin of claim 10 having a molecular weight of 500 to 30,000.

12. The polyisoolefin of claim 11 having a molecular weight of 500 to 20,000.

13. The polyisoolefin of claim 10 having a molecular weight of 20,000 to 500,000.

14. A method for preparing functionalized polyisoolefins comprising the steps of: (a) dehydrohalogenating a halogen-terminated polyisoolefin in a hydrocarbon solvent in the presence of alkoxide of the formula RO-M wherein R is alkyl of at least 5 carbon atoms and M is alkali metal; (b) reacting the product from step (a) with maleic anhydride, and (c) recovering PIB-SA.

15. A method for preparing a hydrolytically stable star-branched polymeric material having a **dendrimer** core and polyolefin branches, comprising the steps of: (a) reacting a functionalized polyolefin with a hydrolytically stable **dendrimer** having primary amine functionality in an outer core, and (b) recovering star-branched polymeric material.

16. The star-branched polymeric material prepared by the method of claim 15.

17. A hydrolytically stable star branched polymeric material comprising a hydrolytically stable **dendrimer** core with branches of polyolefin.

18. The star branched polymeric material of claim 17 wherein the polyolefin is a polyisoolefin.

19. The star-branched material of claim 18 wherein the polyisoolefin is polyisobutylene.

20. The star branched polymeric material of claim 19 wherein at least two polyisobutylene branches have different molecular weights.

21. The star branched polymeric material of claim 19 wherein the polyisobutylene branches have a molecular weight between 500 and 20,000.

22. The star branched polymeric material of claim 17 comprising a mixture of **dendrimer** cores of at least 2 generations.

23. The star branched polymeric material of claim 19 also comprising branches of **polyethylene**, polypropylene or ethylene-propylene copolymer.

24. The star branched polymeric material of claim 17 wherein the polyolefin is a alpha-olefin polymer.

25. A composition comprising a blend of polyalpha-olefins with a star-branched polymer comprising a hydrolytically stable **dendrimer** core with branches of a polyisoolefin, polyalpha-olefins or a mixture of polyisoolefins and polyalpha-olefins.

26. The composition of claim 25 wherein polyalpha-olefin is selected from **polyethylene**, polypropylene, ethylene-propylene copolymers, and polyisobutylene.

27. The composition of claim 25 wherein the polyolefin is polypropylene prepared with a metallocene based catalyst.

28. A film comprising polyolefin blended with a star branched polymeric material comprising a hydrophilic **dendrimer** core with branches comprising a polyisoolefin.

L10 ANSWER 11 OF 19 USPATFULL on STN
AN 2003:24093 USPATFULL
TI Zeolite-substrate composite comprising a patterned zeolite layer on a substrate and preparation thereof
IN Yoon, Kyung-Byung, Seoul, KOREA, REPUBLIC OF
Lee, Goo-Soo, Seoul, KOREA, REPUBLIC OF
Ha, Kwang, Seoul, KOREA, REPUBLIC OF
Lee, Yun-Jo, Seoul, KOREA, REPUBLIC OF
Chun, Yu-Sung, Kyunggi-do, KOREA, REPUBLIC OF
Park, Yong-Soo, Seoul, KOREA, REPUBLIC OF
PI US 2003017936 A1 20030123
US 6693055 B2 20040217
AI US 2002-169187 A1 20020628 (10)
WO 2001-KR1854 20011101
PRAI KR 2000-64534 20001101
DT Utility
FS APPLICATION
LREP Nixon & Vanderhye, 1100 North Glebe Road 8th Floor, Arlington, VA, 22201-4714
CLMN Number of Claims: 15
ECL Exemplary Claim: 1
DRWN 8 Drawing Page(s)
LN.CNT 1016
CAS INDEXING IS AVAILABLE FOR THIS PATENT.
AB The present invention relates to a method for the preparation of a zeolite-substrate composite comprising a patterned zeolite monolayer or multilayer on a substrate, which comprises forming a pattern of a linking compound on the substrate by a selective irradiation with a UV ray, a selective application of a linking compound or a blocking compound, or a selective deposition of a metal, and combining zeolite particles on the portion whereon the linking compound is patterned. The substrate is selected from a group consisting of a substrate having surface hydroxyl groups, a metal capable of being reacted with thiol or amino groups, and a polymeric material having various surface functional groups. The present invention also relates to a zeolite-substrate composite comprising a patterned zeolite monolayer or multilayer on a substrate prepared by said method.
CLM What is claimed is:
1. A method for the preparation of a zeolite-substrate composite comprising a patterned zeolite monolayer or multilayer, characterized in that it comprises (i) combining a linking compound onto the surface of substrate, (ii) modifying the linking compound combined to the substrate or the functional group thereof by irradiating UV ray through a photomask having a pattern, (iii) selectively forming a zeolite layer on the area to which UV ray is or is not irradiated, and (iv) optionally performing a calcination.

2. A method for the preparation of a zeolite-substrate composite comprising a patterned zeolite monolayer or multilayer, characterized in that it comprises (i) combining a linking compound to a part of the surface of the substrate so as to have a predetermined pattern and then combining a blocking compound to the remaining surface of the substrate, or combining a blocking compound to a part of the surface of the substrate so as to have a predetermined pattern and then combining a linking compound to the remaining surface of the substrate, (ii) forming

a zeolite layer on the area to which the linking compound is combined, and (iii) optionally performing a calcination.

3. A method for the preparation of a zeolite-substrate composite comprising a patterned zeolite monolayer or multilayer, characterized in that it comprises (i) depositing a metal such as platinum onto a part of the substrate surface to form a metal layer so as to have a predetermined pattern. (ii) forming a zeolite layer by growing crystal or combining zeolite-linking compound on the remaining area, and (iii) optionally performing a calcination.

4. The method as claimed in claim 1, characterized in that said zeolite layer is formed after removing the portion to which UV ray is irradiated or the portion to which UV ray is not irradiated.

5. The method as claimed in claim 2, characterized in that said linking compound having functional group at both terminals or a blocking compound which does not have any functional group at the one **terminal** such as octadecyltrichlorosilane was applied and then bonded on a part of the substrate surface by the stamp method

6. The method as claimed in any one of claims 1 to 5, characterized in that the patterned or non-patterned layer of zeolite was previously formed on all or a part of the substrate surface.

7. The method as claimed in any one of claims 1 to 5, characterized in that said substrate is selected from the group consisting of: 1) all substances containing hydroxyl groups on the surface, 2) metals capable of reacting with a thiol or amino group, 3) polymers having various functional groups on their surfaces, 4) semiconductive materials, 5) natural or synthetic zeolite or molecular sieve analogs,

8. The method as claimed in any one of claims 1 to 5, characterized in that the linking compounds which form the substrate-linking compound and the zeolite (or its analog)-linking compound are identical or different from each other and selected from the compounds of the following formula 1 to 7 or a combination thereof.

R.sub.3Si-L-X (1)
MR'.sub.4 (2)
Y-L-Y (3)
R.sub.3Si-L-Y (4)
HS-L-X (5)
HS-L-SiR.sub.3 (6)
HS-L-Y (7)

Wherein, R represents a halogen atom, C.sub.1-C.sub.4 alkoxy or alkyl group; L represents a hydrocarbon residue, e.g., substituted or unsubstituted C.sub.1-Cl.sub.7 alkyl, aralkyl or aryl group, which may have at least one heteroatom such as oxygen, nitrogen and sulfur; X represents a leaving group such as a halogen atom; provided that at least one of the three Rs in a SiR.sub.3 group denote a halogen or alkoxy group; R' is the same as R and the two of four R's in MR'.sub.4 denote a halogen or alkoxy group; M represents Si or a transition metal such as Ti or Zr; Y represents a ligand having a functional group selected from a group consisting of hydroxyl, thiol, amine, ammonium, sulfone and its salt, carboxyl acid and its salt, acid anhydride, epoxy, aldehyde, ester, acrylate, isocyanate (--NCO), sugar residue, double bond, triple bond, diene, diyne, alkylphosphine, alkylamine as well as a reactive functional group of various coordination compounds capable of exchanging their ligands; provided that said functional group can exist in the middle or at the **terminal** ends of the ligands.

9. The method as claimed in any one of claims 1 to 5, characterized in that zeolite is selected from the group consisting of: 1) Natural and synthetic zeolite, 2) Modified molecular sieve wherein all or a part of

the silicon atoms in the zeolite skeleton are replaced with other atoms such as phosphorous (P) or the like (e.g., AlPO.sub.4, SAPO, MeAPO, MeAPSO type molecular sieve), 3) Modified molecular sieve in which all or a part of the aluminum atoms in the zeolite skeleton are replaced with other atoms such as boron (B), gallium (Ga). Titanium (Ti), etc., 4) Molecular sieves by the combination of the above modifications of the above modifications of item 2 and 3, 5) Porous metals or silicon oxides (e.g., silicalite, MCM type porous silica, porous titanium dioxide, niobium dioxide, etc.) or mixed oxide thereof, or 6) Porous molecular sieves prepared with any other elements alone or in a mixture.

10. The method as claimed in claim 9, characterized in that said linking compound can be intermediated by at least a compound selected from a group consisting of fullerene (C.sub.60, C.sub.70), carbon nanotubes, α,ω-dialdehyde, dicarboxylic acid, dicarboxyl acid anhydride, amine-**dendrimer**, **polyethylene** imine, α,ω-diamine, a complex of [M(salan)] (wherein M represents Co, Ni, Cr, Mn, Fe and the like, and salan represents N,N-bis(salicylidene)ethylenediamine), and metal porphyrin derivatives.

11. The method as claimed in any one of claims 1 to 5, characterized in that said zeolite layer is formed or originated from zeolite (or analogous molecular sieve), zeolite (or analogous molecular sieve)-linking compound or crystal grown zeolite.

12. The method as claimed in any one of claims 1 to 5, characterized in that, on a patterned zeolite layer, an upper layer consisting of the same or different kind of zeolite is formed so as to have a pattern.

13. The method as claimed in claim 12, characterized in that the upper layer is formed so as to have a pattern the same or different from that of the lower layer.

14. A composite of zeolite-substrate comprising a patterned layer of zeolite prepared according to any one of claims 1 to 5.

15. A composite of zeolite-substrate as claimed in claim 14, characterized in that it comprises a plural of zeolite layers, of which type are the same or different from each other.

L10 ANSWER 12 OF 19 USPATFULL on STN
AN 2002:343506 USPATFULL
TI Heat-crosslinkable cosmetic composition
IN Bernard, Pascale, Sucy-en-Brie, FRANCE
Ramin, Roland, Paris, FRANCE
Mondet, Jean, Aulnay-sous-Bois, FRANCE
PA L'OREAL, Paris, FRANCE (non-U.S. corporation)
PI US 2002197229 A1 20021226
AI US 2002-115280 A1 20020404 (10)
PRAI FR 2001-4681 20010406
DT Utility
FS APPLICATION
LREP STEPTOE & JOHNSON LLP, 1330 Connecticut Ave., N.W., Washington, DC, 20036
CLMN Number of Claims: 18
ECL Exemplary Claim: 1
DRWN No Drawings
LN.CNT 558
CAS INDEXING IS AVAILABLE FOR THIS PATENT.
AB The invention relates to a heat-crosslinkable cosmetic composition comprising, in a cosmetically acceptable medium, (a) at least one compound comprising at least two functions containing labile hydrogen, and (b) at least one compound comprising at least two blocked isocyanate functions, which can be unblocked by heating, the average functionality of the system, that is to say the total number of functions containing labile hydrogen and of blocked isocyanate functions relative to the total number of molecules of compounds (a) and (b), being strictly

greater than 2, and also to a process for coating keratin substrates using such a composition.

CLM What is claimed is:

1. Heat-crosslinkable cosmetic composition comprising, in a cosmetically acceptable medium, (a) at least one compound comprising at least two functions containing labile hydrogen, and (b) at least one compound comprising at least two blocked isocyanate functions, which can be unblocked by heating, the average functionality of the system, that is to say the total number of functions containing labile hydrogen and of blocked isocyanate functions relative to the total number of molecules of compounds (a) and (b), being strictly greater than 2.

2. Heat-crosslinkable cosmetic composition according to claim 1, characterized in that some or all of the compounds (a) also bear one or more blocked isocyanate functions and/or in that some or all of the compounds (b) also bear one or more functions containing labile hydrogen.

3. Heat-crosslinkable cosmetic composition according to claim 1 or 2, characterized in that the functions containing labile hydrogen, borne by compound (a), are chosen from primary amine (--NH.sub.2), secondary amine (>NH), hydroxyl (--OH), carboxylic acid (--COOH) and thiol (--SH) functions.

4. Heat-crosslinkable cosmetic composition according to claims 1 to 3, characterized in that the blocked isocyanate functions of compound (b) correspond to the formula --NH--C(=O)--B in which B represents a radical derived from a blocking agent BH chosen from organic compounds comprising one or more, and preferably only one labile hydrogen atom.

5. Heat-crosslinkable cosmetic composition according to claim 4, characterized in that the blocking agent BH is chosen from monoalcohols, monophenols, amides, oximes, β-dicarbonyl compounds, pyrazoles, esters of hydroxyamic acid and of C.sub.1-6 alcohols, triazoles, imidazolines, tetrahydropyrimidines and imidazoles.

6. Heat-crosslinkable cosmetic composition according to claim 4 or 5, characterized in that the blocking agent BH has a boiling point of greater than 45° C. and less than or equal to 100° C., preferably between 45° C. and 80° C.

7. Heat-crosslinkable cosmetic composition according to any one of the preceding claims, characterized in that compound (b) bearing at least two blocked isocyanate functions is obtained by reaction between a blocking agent BH defined in claims 4 to 6 and a compound comprising at least two isocyanate functions chosen from a) aliphatic, cycloaliphatic and/or aromatic diisocyanates especially containing from 4 to 50 and preferably from 4 to 30 carbon atoms, such as hexamethylene diisocyanate, isophorone diisocyanate, toluene diisocyanate and diphenylmethane diisocyanate, b) aliphatic, cycloaliphatic and/or aromatic triisocyanates especially containing from 4 to 100 and preferably from 4 to 30 carbon atoms, such as those of formula ##STR4## in which each R' independently represents a linear, hollow branched or cyclic hydrocarbon-based radical containing from 2 to 30 carbon atoms, c) polycondensates containing **terminal** or lateral isocyanate groups, such as polyurethanes, polyureas, polyethers, polyesters, polyamides and perfluoropolyethers, d) polymers resulting from the copolymerization of vinyl, allylic and/or (meth)acrylic monomers and of ethylenically unsaturated comonomers comprising a free isocyanate function, e) silicones containing isocyanate groups.

8. Heat-crosslinkable cosmetic composition according to any one of the preceding claims, characterized in that compound (a) is chosen from diols and polyols, primary and/or secondary diamines and polyamines, amino alcohols and polymers comprising at least two functions containing labile hydrogen.

9. Heat-crosslinkable cosmetic composition according to claim 8,

characterized in that compound (a) is chosen from C.sub.1-4 alkylene glycols, glycerol, trimethylolpropane, pentaerythritol, poly(C.sub.1-4 alkylene) glycols such as **polyethylene** glycol or polypropylene glycol or copolymers thereof, the product of condensation of propylene glycol and of trimethylolpropane, castor oil, phytanetriol, sugars and carbohydrates such as sucrose or cellulose, ethylenediamine, 1,3-diaminopropane, lysine, 2-amino-2-methyl-1-propanol, poly(alkylenoxy)diamines, nitrocellulose, cellulose esters, cellulose ethers, polyester resins, silicones, perfluoropolyethers, alkyds and polyketones with hydroxylated end groups, poly(vinyl alcohol) and copolymers based on vinyl alcohol, copolymers of allyl alcohol,, copolymers based on C.sub.2-10 hydroxyalkyl (meth)acrylate, copolymers based on vinylamine or allylamine, silicones and perfluoroethers with primary or secondary amine end groups, hyperbranched **dendrimers** or polymers with hydroxyl or primary amine end groups.

10. Heat-crosslinkable cosmetic composition according to any one of the preceding claims, characterized in that compounds (a) and (b) represent from 1% to 50% by weight of the cosmetic composition.

11. Heat-crosslinkable cosmetic composition according to one of the preceding claims, characterized in that the total number of functions containing free hydrogen and of blocked isocyanate functions relative to the total number of molecules of compounds (a) and (b) is greater than 2.2 and preferably between 2.5 and 100.

12. Heat-crosslinkable cosmetic composition according to any one of the preceding claims, characterized in that it also comprises one or more compounds for catalysing the thermal unblocking reaction of the isocyanate functions of compound (b), chosen from tertiary amines such as diazabicyclo[2.2.2] octane, quinuclidine and 3,3,6,9,9-pentamethyl-2,10-diazabicyclo[4.4.0] dec-1-ene, tin chloride, organometallic compounds such as metallic acetonylacetates, organometallic tin compounds, calcium hexanoate, calcium 2-ethylhexanoate, calcium octanoate and calcium linoleate, dibutyltin dilaurate, bismuth tris(2-ethylhexanoate) and zinc bis(2-ethylhexanoate).

13. Heat-crosslinkable cosmetic composition according to claim 12, characterized in that the concentration of the compound for catalysing the thermal unblocking reaction of the isocyanate functions of compound (b) is between 0.1% and 5% by weight and preferably between 0.2% and 3% by weight relative to the total weight of compound (b) present.

14. Process for coating a keratin substrate, comprising the steps consisting in applying to the keratin substrate a coat of a cosmetic composition according to one of the preceding claims, in optionally leaving the deposited cosmetic composition to dry, and in subjecting the deposited cosmetic composition, optionally dried, to heating up to a temperature that is sufficient and for a time that is sufficient to bring about unblocking of some or all of the blocked isocyanate functions borne by compound (a), so as to allow the crosslinking of the deposit.

15. Process according to claim 14, characterized in that the keratin substrate is the nail, the hair, the eyelashes and the eyebrows.

16. Process according to either of claims 14 and 15, characterized in that the cosmetic composition is heated to a temperature of between 45° C. and 150° C. and preferably between 50° C. and 100° C.

17. Process according to one of claims 14 to 16, characterized in that the duration of heating is between 2 minutes and 1 hour and preferably between 5 and 15 minutes.

18. Process according to one of claims 14 to 17, characterized in that the heating is carried out using a source of heat chosen from a heating chamber, a device for projecting heat such as a hairdryer, or a source

of radiation allowing the temperature of the composition to be raised, such as an infrared lamp.

L10 ANSWER 13 OF 19 USPATFULL on STN
AN 2002:340236 USPATFULL
TI Method for making a device for the simultaneous detection of multiple analytes
IN Fitzgerald, Stephen Peter, Co. Antrim, UNITED KINGDOM
Lamont, John Victor, Co. Antrim, UNITED KINGDOM
McConnell, Robert Ivan, Co. Antrim, UNITED KINGDOM
Benchikh, El Ouard, Co. Antrim, UNITED KINGDOM
PA Randox Laboratories, LTD, Antrim, UNITED KINGDOM (non-U.S. corporation)
PI US 6498010 B1 20021224
AI US 1999-413799 19991007 (9)
RLI Division of Ser. No. US 1998-61171, filed on 16 Apr 1998
PRAI EP 1998-97302707 19980416
DT Utility
FS GRANTED
EXNAM Primary Examiner: Nguyen, Bao-Thuy L.
LREP Oliff & Berridge, PLC
CLMN Number of Claims: 20
ECL Exemplary Claim: 1
DRWN 17 Drawing Figure(s); 10 Drawing Page(s)
LN.CNT 965
CAS INDEXING IS AVAILABLE FOR THIS PATENT.
AB A solid state device for performing multi-analyte assays, comprises a substrate and a multiplicity of discrete reaction sites each bearing a ligand covalently bonded to the substrate, wherein the surface of the substrate between the reaction sites is inert with respect to analyte. Such a device may be obtained by a process of activating the surface of the substrate, and applying an array of ligands on to discrete areas on the surface.
CLM What is claimed is:
1. A method for forming a solid state device for performing multi-analyte assays comprising a substrate and a multiplicity of discrete reaction sites each bearing a ligand covalently bonded to a surface of the substrate, wherein areas of the surface of the substrate, which are between the reaction sites, are inert with respect to analyte, said method comprising the steps of: activating all of said surface of the substrate; rendering hydrophobic all of said activated surface; and applying an array of ligands onto discrete areas of the hydrophobic surface such that said ligands are not applied to said areas between the reaction sites.

2. The method according to claim 1, wherein said surface of the substrate is non-uniform.

3. The method according to claim 2, wherein said substrate comprises an array of reaction channels, ridges, pillars, spots, chambers, dimples, wells or pits.

4. The method according to claim 1, wherein the substrate is of ceramic, glass, quartz or silicon.

5. The method according to claim 1, wherein said device has an area of less than 1 cm.sup.2.

6. The method according to claim 1, wherein the area of each reaction site is less than 1 mm.sup.2.

7. The method according to claim 1, wherein said surface is rendered hydrophobic by reaction with an organosilane.

8. The method according to claim 7, wherein the organosilane has the formula (RO).sub.3Si--(CH.sub.2).sub.n--X, wherein each R is a hydrocarbyl group, n is an integer, and X is a functional group.

9. The method according to claim 7, wherein the method includes the use of a bifunctional cross-linker to facilitate covalent attachment of biological ligands to the organosilane.

10. The method according to claim 7, wherein a photolabile cross-linker is used to react with the organosilane having a nucleophilic or electrophilic **terminal** group.

11. The method according to claim 1, wherein the step of applying the ligands comprises an initial step of derivatizing the hydrophobic surface with macromolecules containing chemical groups that facilitate covalent attachment of the ligands.

12. The method according to claim 11, wherein said macromolecules are selected from the group consisting of polystyrene latex particles, **dendrimers** and **polyethylene** glycol.

13. The method according to claim 1, wherein said method additionally comprises applying ligands that bind materials whose presence interferes with assaying an analyte.

14. The method according to claim 1, wherein the substrate is ceramic.

15. The method according to claim 1, further comprising blocking said areas between the reaction sites.

16. The method according to claim 1, wherein said surface is activated and rendered hydrophobic by reaction with an organosilane.

17. The method according to claim 1, said method consisting essentially of: activating all of said surface of the substrate; rendering hydrophobic all of said activated surface; and applying an array of ligands onto discrete areas of the hydrophobic surface such that said ligands are not applied to said areas between the reaction sites.

18. The method according to claim 1, said method consisting of: activating all of said surface of the substrate; rendering hydrophobic all of said activated surface; and applying an array of ligands onto discrete areas of the hydrophobic surface such that said ligands are not applied to said areas between the reaction sites.

19. A method for forming a solid state device for performing multi-analyte assays comprising a substrate and a multiplicity of discrete reaction sites each bearing a ligand covalently bonded to a surface of the substrate, wherein areas of the surface of the substrate, which are between the reaction sites, are inert with respect to analyte, said method comprising the steps of: rendering hydrophobic all of said surface of the substrate, wherein said surface is an activated surface; and applying an array of ligands onto discrete areas of the hydrophobic surface such that said ligands are not applied to said areas between the reaction sites.

20. The method according to claim 19, wherein said surface is rendered hydrophobic by reaction with an organosilane.

L10 ANSWER 14 OF 19 USPATFULL on STN
AN 2002:172482 USPATFULL
TI Acid-sensitive compounds, their preparation and uses
IN Bessodes, Michel, Villejuif, FRANCE
Masson, Christophe, Montgeron, FRANCE
Scherman, Daniel, Paris, FRANCE
Wetzer, Barbara, Paris, FRANCE
PI US 2002091242 A1 20020711
AI US 2001-972854 A1 20011010 (9)
PRAI US 2000-239116P 20001011 (60)
DT Utility
FS APPLICATION

LREP Finnegan, Henderson, Farabow, Garrett & Dunner, L.L.P., 1300 I Street, N.W., Washington, DC, 20005-3315
CLMN Number of Claims: 38
ECL Exemplary Claim: 1
DRWN 8 Drawing Page(s)
LN.CNT 2467
CAS INDEXING IS AVAILABLE FOR THIS PATENT.
AB Novel acid-sensitive compounds comprising a cyclic ortho-ester that is acid-sensitive, and their salts, and comprising at least one hydrophilic substituent. These compounds are useful, for example, for forming conjugates (liposomes, complexes, nanoparticles and the like) with biologically active substances and releasing them into cellular tissues or compartments whose pH is acidic, or as nonionic surfactant for stabilizing particles encapsulating a biologically active substance and then destabilizing them in acid medium, or alternatively as a vector covalently linked to a therapeutic molecule so as to release said therapeutic molecule into the cellular tissues or compartments whose pH is acidic.
CLM What is claimed is:

1. An acid-sensitive compound, or a salt thereof, comprising a cyclic ortho-ester and at least one hydrophilic substituent chosen from polyalkylene glycols, monosaccharides, polysaccharides, hydrophilic therapeutic molecules, or linear or branched alkyls, wherein each linear or branched alkyl comprises at least 3 carbon atoms, wherein at least one of the methylene groups is optionally replaced with an amino group that is optionally substituted, and wherein at least one **terminal** methyl group of said linear or branched alkyl is substituted with at least one primary amine, secondary amine, tertiary amine, quaternary amine, guanidine or cyclic guanidine.

2. The acid-sensitive compound according to claim 1, or a salt thereof, of formula (I): ##STR30## wherein: g is an integer chosen from 0, 1, 2, 3 or 4, G is a hydrogen atom, a straight or branched alkyl group comprising 1 to 6 carbon atoms optionally comprising at least one unsaturation, or an aryl group,, G.sub.1 and G.sub.2 is a pair of substituents chosen from one of the following substituent pairs: (a) wherein one subtituent is a hydrophilic substituent chosen from a linear or branched alkyl group comprising at least 3 carbon atoms, wherein at least one of the methylene groups is optionally replaced with an amino group that is optionally substituted, and wherein at least one **terminal** methyl group of said linear or branched alkyl groups are substituted with at least one primary amine, secondary amine, tertiary amine, quaternary amine, guanidine, or cyclic guanidine, and the other substituent is a hydrophobic substituent chosen from single-chain alkyls, double-chain alkyls, steroid derivatives, or hydrophobic **dendrimers**; (b) or wherein one substituent is a hydrophobic linear alkyl group comprising 10 to 24 carbon atoms and optionally comprising at least one unsaturation, and the other substituent is a group of formula (II): ##STR31## wherein i is an integer ranging from 1 to 4, j is an integer ranging from 9 to 23, and said hydrophilic substituent of formula (II) is a linear or branched alkyl comprising at least 3 carbon atoms, wherein at least one of the methylene groups is optionally replaced with an amino group that is optionally substituted , and wherein at least one **terminal** methyl group of said linear or branched alkyl is substituted with at least one primary amine, secondary amine, tertiary amine, quaternary amine, guanidine, or cyclic guanidine; (c) or wherein one substituent is a hydrophilic polyalkylene glycol, a monosaccharide,or a polysaccharide, and the other substituent is a polyalkylene imine; (d) or wherein one substituent is a polyalkylene glycol, monosaccharide, or polysaccharide, and the other substituent is a single-chain alkyl, double-chain alkyl, steroid derivative, hydrophobic **dendrimer**, or a covalent conjugate between a single-chain alkyl, a double-chain alkyl, a steroid derivative, or a hydrophobic **dendrimer** and a polyalkylene glycol molecule comprising 1 to 20 monomeric units; (e) or wherein one substituent is a polyalkylene glycol, a monosaccharide, or a polysaccharide, and the other substituent is a therapeutic molecule; (f) or wherein one substituent is a hydrophilic therapeutic molecule,

and the other substituent is a single-chain alkyl, a double-chain alkyl, a steroid derivative, or a hydrophobic **dendrimers**.

3. The acid-sensitive compound according to claim 2, or a salt thereof, wherein G is a hydrogen atom, methyl, ethyl, or phenyl.

4. The acid-sensitive compound according to claim 2, or a salt thereof, wherein each alkyl chain of said single-chain alkyl and said double-chain alkyl comprises 10 to 24 carbon atoms and optionally comprises at least one unsaturation.

5. The acid-sensitive compound according to claim 2, or a salt thereof, wherein said steroid derivative is a sterol, a steroid, or a steroid hormone.

6. The acid-sensitive compound according to claim 2, or a salt thereof, wherein said hydrophobic **dendrimer** is poly(benzyl ether).

7. The acid-sensitive compound according to claim 2, or a salt thereof, wherein said polyalkylene glycol is a polyalkylene glycol having an average molecular weight ranging from 10.sup.2 to 10.sup.5 Daltons.

8. The acid-sensitive compound according to claim 7, or a salt thereof, wherein said polyalkylene glycol is **polyethylene** glycol (PEG) having an average molecular weight ranging from 10.sup.2 to 10.sup.5 Daltons.

9. The acid-sensitive compound according to claim 2, or a salt thereof, wherein said monosaccharide or polysaccharide is chosen from a pyranose, a furanose, a dextran, α-amylose, amylopectin, a fructan, a mannan, a xylan, or a arabinan.

10. The acid-sensitive compound according to claim 2, or a salt thereof, wherein said polyalkylene glycol, monosaccharide, or polysaccharide is covalently linked to a targeting element.

11. The acid-sensitive compound according to claim 10, or a salt thereof, wherein said targeting element is a sugar, a peptide, a protein, a oligonucleotide, a lipid, a neuromediator, a hormone, a vitamin, or a derivative thereof.

12. The acid-sensitive compound according to claim 2, or a salt thereof, wherein said polyalkyleneimineis a polymer comprising a monomeric units of the formula: ##STR32## wherein R is a hydrogen atom or a group of the formula: ##STR33## wherein n is an integer ranging from 2 to 10, p and q are integers chosen such that the sum p+q is the average molecular weight of the polymer ranges from 100 to 10.sup.7 Da, wherein the value of n may vary between the different units --NR--(CH.sub.2)n--.

13. The acid-sensitive compound according to claim 2, or a salt thereof, wherein each of the substituents G.sub.1 and G.sub.2 are linked to the cyclic ortho-ester via a spacer molecule.

14. The acid-sensitive compound according to claim 13, or a salt thereof, wherein said spacer molecule is an alkyl group comprising 1 to 6 carbon atoms, a carbonyl group, an ester group, an ether group, an amide group, a carbamate group, a thiocarbamate group, a glycerol group, a urea group, a thiourea group, or a combination of said groups.

15. The acid-sensitive compound according to claim 2, or a salt thereof, wherein said therapeutic molecule is a peptide, an oligopeptide, a protein, an antigen, an antibody to said antigen, an enzyme, an inhibitor of said enzyme, a hormone, an antibiotic, an analgesic, a bronchodilator, an antimicrobial, an antihypertensive agent, a cardiovascular agent, an agent that acts on the central nervous system, an antihistamine, an antidepressant, a tranquilizer, an anticonvulsant, an anti-inflammatory substance, a stimulant, an antiemetic agent, a diuretic agent, an antispasmodic agent, an antiischemic agent, an agent

limiting cell death, or an anticancer agent.

16. The acid-sensitive compound according to claim 2, or a salt thereof, wherein said linear or branched alkyl comprises at least 3 carbon atoms, wherein at least one of the methylene groups is optionally replaced with an amino group that is substituted with a methyl group.

17. A composition comprising at least one acid-sensitive compound, or a salt thereof, comprising a cyclic ortho-ester and at least one hydrophilic substituent chosen from polyalkylene glycols, monosaccharides, polysaccharides, hydrophilic therapeutic molecules, or linear or branched alkyls, wherein each linear or branched alkyl comprises at least 3 carbon atoms, wherein at least one of the methylene groups is optionally replaced with an amino group that is optionally substituted, and wherein at least one **terminal** methyl group of said linear or branched alkyl is substituted with at least one primary amine, secondary amine, tertiary amine, quaternary amine, guanidine or cyclic guanidine.

18. The composition according to claim 17, comprising at least one acid-sensitive compound of formula (I): ##STR34## or a salt thereof, wherein: g is an integer chosen from 0, 1, 2, 3 or 4, G is a hydrogen atom, a straight or branched alkyl group comprising 1 to 6 carbon atoms optionally comprising at least one unsaturation, or an aryl group, G.sub.1 and G.sub.2 is a pair of substituents chosen from one of the following substituent pairs: (a) wherein one subtituent is a hydrophilic substituent chosen from a linear or branched alkyl group comprising at least 3 carbon atoms, wherein at least one of the methylene groups is optionally replaced with an amino group that is optionally substituted, and wherein at least one **terminal** methyl group of said linear or branched alkyl groups are substituted with at least one primary amine, secondary amine, tertiary amine, quaternary amine, guanidine, or cyclic guanidine, and the other substituent is a hydrophobic substituent chosen from single-chain alkyls, double-chain alkyls, steroid derivatives, or hydrophobic **dendrimers**; (b) or wherein one substituent is a hydrophobic linear alkyl group comprising 10 to 24 carbon atoms and optionally comprising at least one unsaturations, and the other substituent is a group of formula (II): ##STR35## wherein i is an integer ranging from 1 to 4, j is an integer ranging from 9 to 23, and said hydrophilic substituent of formula (II) is a linear or branched alkyl comprising at least 3 carbon atoms, wherein at least one of the methylene groups is optionally replaced with an amino group that is optionally substituted, and wherein at least one **terminal** methyl group of said linear or branched alkyl is substituted with at least one primary amine, secondary amine, tertiary amine, quaternary amine, guanidine, or cyclic guanidine; (c) or wherein one substituent is a hydrophilic polyalkylene glycol, a monosaccharide, or a polysaccharide, and the other substituent is a polyalkylene imine; (d) or wherein one substituent is a polyalkylene glycol, monosaccharide, or polysaccharide, and the other substituent is a single-chain alkyl, double-chain alkyl, steroid derivative, hydrophobic **dendrimer**, or a covalent conjugate between a single-chain alkyl, a double-chain alkyl, a steroid derivative, or a hydrophobic **dendrimer** and a polyalkylene glycol molecule comprising 1 to 20 monomeric units; (e) or wherein one substituent is a polyalkylene glycol, a monosaccharide, or a polysaccharide, and the other substituent is a therapeutic molecule; (f) or wherein one substituent is a hydrophilic therapeutic molecule, and the other substituent is a single-chain alkyl, a double-chain alkyl, a steroid derivative, or a hydrophobic **dendrimers**.

19. The composition according to claim 18, wherein G.sub.1 and G.sub.2 of said acid-sensitive compound are defined as in said substituent pairs (a), (b), (c) or (d); and wherein said composition further comprises at least one biologically active substance.

20. The composition according to claim 19, wherein said biologically active substance is a nucleic acid, a peptide, an oligopeptide, a

protein, an antigen, an antibody to said antigen, an enzyme, an inhibitor of said enzyme, a hormone, an antibiotic, an analgesic, a bronchodilator, an antimicrobial, an antihypertensive agent, a cardiovascular agent, an agent that acts on the central nervous system, an antihistamine, an antidepressant, a tranquilizer, an anticonvulsant, an anti-inflammatory substance, a stimulant, an antiemetic agent, a diuretic agent, an antispasmodic agent, an antiischemic agent, an agent limiting cell death, or an anticancer agent.

21. The composition according to claim 17, further comprising at least one adjuvant.

22. The compositions according to claim 21, wherein said adjuvant comprises at least one neutral lipid.

23. The composition according to claim 22, wherein said adjuvant comprises at least one neutral lipid chosen from natural zwitterionic lipids, synthetic zwitterionic lipids, and lipids lacking an ionic charge under physiological conditions.

24. The composition according to claim 23, wherein said adjuvant comprises at least one neutral lipid chosen from dioleoylphosphatidylethanolamine (DOPE), oleoyl-palmitoylphosphatidylethanolamine (POPE), distearoylphosphatidylethanolamine (DSPE), dipalmitoylphosphatidyl-ethanolamine (DPPE), dimirystoylphosphatidylethanolamine (DMPE), DOPE N-methylated 1 to 3 times, POPE N-methylated 1 to 3 times, DSPE N-methylated 1 to 3 times, DPPE N-methylated 1 to 3 times, phosphatidylglycerols, diacylglycerols, glycosyldiacylglycerols, cerebrosides, sphingolipids, and asialogangliosides.

25. The composition according to claim 24, wherein said adjuvant comprises at least one cerebroside chosen from galactocerebrosides.

26. The composition according to claim 24, wherein said adjuvant comprises at least one sphingolipid chosen from sphingomyelins,

27. The composition according to claim 24, wherein said adjuvant comprises at least one asialogangliosides chosen from asialoGM1 and asialoGM2.

28. The composition according to claim 17, further comprising a pharmaceutically acceptable vehicle for an injectable formulation.

29. The composition according to claim 17, further comprising a pharmaceutically acceptable vehicle for administration to skin or mucous membranes.

30. A method for treating a disease or disorder comprising administering at least one acid-sensitive compound, or a salt thereof, comprising a cyclic ortho-ester and at least one hydrophilic substituent chosen from polyalkylene glycols, monosaccharides, polysaccharides, hydrophilic therapeutic molecules, or linear or branched alkyls, wherein each linear or branched alkyl comprises at least 3 carbon atoms, wherein at least one of the methylene groups is optionally replaced with an amino group that is optionally substituted, and wherein at least one **terminal** methyl group of said linear or branched alkyl is substituted with at least one primary amine, secondary amine, tertiary amine, quaternary amine, guanidine or cyclic guanidine.

31. The method according to claim 30, comprising administering at least one acid-sensitive compound of formula (I): ##STR36## or a salt thereof, wherein: g is an integer chosen from 0, 1, 2, 3 or 4, G is a hydrogen atom, a straight or branched alkyl group comprising 1 to 6 carbon atoms optionally comprising at least one unsaturation, or an aryl group, G.sub.1 and G.sub.2 is a pair of substituents chosen from one of the following substituent pairs: (a) wherein one subtituent is a hydrophilic substituent chosen from a linear or branched alkyl group

comprising at least 3 carbon atoms, wherein at least one of the methylene groups is optionally replaced with an amino group that is optionally substituted, and wherein at least one **terminal** methyl group of said linear or branched alkyl groups are substituted with at least one primary amine, secondary amine, tertiary amine, quaternary amine, guanidine, or cyclic guanidine, and the other substituent is a hydrophobic substituent chosen from single-chain alkyls, double-chain alkyls, steroid derivatives, or hydrophobic **dendrimers**; (b) or wherein one substituent is a hydrophobic linear alkyl group comprising 10 to 24 carbon atoms and optionally comprising at least one unsaturations, and the other substituent is a group of formula (II): ##STR37## wherein i is an integer ranging from 1 to 4, j is an integer ranging from 9 to 23, and said hydrophilic substituent of formula (II) is a linear or branched alkyl comprising at least 3 carbon atoms, wherein at least one of the methylene groups is optionally replaced with an amino group that is optionally substituted, and wherein at least one **terminal** methyl group of said linear or branched alkyl is substituted with at least one primary amine, secondary amine, tertiary amine, quaternary amine, guanidine, or cyclic guanidine; (c) or wherein one substituent is a hydrophilic polyalkylene glycol, a monosaccharide,or a polysaccharide, and the other substituent is a polyalkylene imine; (d) or wherein one substituent is a polyalkylene glycol, monosaccharide, or polysaccharide, and the other substituent is a single-chain alkyl, double-chain alkyl, steroid derivative, hydrophobic **dendrimer**, or a covalent conjugate between a single-chain alkyl, a double-chain alkyl, a steroid derivative, or a hydrophobic **dendrimer** and a polyalkylene glycol molecule comprising 1 to 20 monomeric units; (e) or wherein one substituent is a polyalkylene glycol, a monosaccharide, or a polysaccharide, and the other substituent is a therapeutic molecule; (f) or wherein one substituent is a hydrophilic therapeutic molecule, and the other substituent is a single-chain alkyl, a double-chain alkyl, a steroid derivative, or a hydrophobic **dendrimers**.

32. The method according to claim 31, wherein said G.sub.1 and G.sub.2 are defined as in said substituent pairs (a), (b), (c) or (d); and wherein said method further comprises transfection of nucleic acids.

33. The method according to claim 31, wherein said wherein G.sub.1 and G.sub.2 are defined as in said substituent pairs (e) or (f).

34. A method for transfecting a nucleic acid comprising at least one acid-sensitive compound, or a salt thereof, comprising a cyclic ortho-ester and at least one hydrophilic substituent chosen from polyalkylene glycols, monosaccharides, polysaccharides, hydrophilic therapeutic molecules, or linear or branched alkyls, wherein each linear or branched alkyl comprises at least 3 carbon atoms, wherein at least one of the methylene groups is optionally replaced with an amino group that is optionally substituted, and wherein at least one **terminal** methyl group of said linear or branched alkyl is substituted with at least one primary amine, secondary amine, tertiary amine, quaternary amine, guanidine or cyclic guanidine.

35. The method according to claim 34, comprising at least one acid-sensitive compound of formula (I): ##STR38## or a salt thereof, wherein: g is an integer chosen from 0, 1, 2, 3 or 4, G is a hydrogen atom, a straight or branched alkyl group comprising 1 to 6 carbon atoms optionally comprising at least one unsaturation, or an aryl group, G.sub.1 and G.sub.2 is a pair of substituents chosen from one of the following substituent pairs: (a) wherein one subtituent is a hydrophilic substituent chosen from a linear or branched alkyl group comprising at least 3 carbon atoms, wherein at least one of the methylene groups is optionally replaced with an amino group that is optionally substituted, and wherein at least one **terminal** methyl group of said linear or branched alkyl groups are substituted with at least one primary amine, secondary amine, tertiary amine, quaternary amine, guanidine, or cyclic guanidine, and the other substituent is a hydrophobic substituent chosen from single-chain

alkyls, double-chain alkyls, steroid derivatives, or hydrophobic **dendrimers**; (b) or wherein one substituent is a hydrophobic linear alkyl group comprising 10 to 24 carbon atoms and optionally comprising at least one unsaturations, and the other substituent is a group of formula (II): ##STR39## wherein i is an integer ranging from 1 to 4, j is an integer ranging from 9 to 23, and said hydrophilic substituent of formula (II) is a linear or branched alkyl comprising at least 3 carbon atoms, wherein at least one of the methylene groups is optionally replaced with an amino group that is optionally substituted, and wherein at least one **terminal** methyl group of said linear or branched alkyl is substituted with at least one primary amine, secondary amine, tertiary amine, quaternary amine, guanidine, or cyclic guanidine; (c) or wherein one substituent is a hydrophilic polyalkylene glycol, a monosaccharide,or a polysaccharide, and the other substituent is a polyalkylene imine; (d) or wherein one substituent is a polyalkylene glycol, monosaccharide, or polysaccharide, and the other substituent is a single-chain alkyl, double-chain alkyl, steroid derivative, hydrophobic **dendrimer**, or a covalent conjugate between a single-chain alkyl, a double-chain alkyl, a steroid derivative, or a hydrophobic **dendrimer** and a polyalkylene glycol molecule comprising 1 to 20 monomeric units; (e) or wherein one substituent is a polyalkylene glycol, a monosaccharide, or a polysaccharide, and the other substituent is a therapeutic molecule; (f) or wherein one substituent is a hydrophilic therapeutic molecule, and the other substituent is a single-chain alkyl, a double-chain alkyl, a steroid derivative, or a hydrophobic **dendrimers**.

36. The method according to claim 34, comprising transfecting a nucleic acid into at least one cell.

37. The method according to claim 35, wherein said G.sub.1 and G.sub.2 are defined as in said substituent pairs (a), (b), (c) or (d).

38. The method according to claim 35, wherein said G.sub.1 and G.sub.2 are defined as in said substituent pairs (e) or (f).

L10 ANSWER 15 OF 19 USPATFULL on STN
AN 2002:133937 USPATFULL
TI Pneumatic tire having a rubber component containing a dendrimer
IN Frank, Uwe Ernst, Marpingen, GERMANY, FEDERAL REPUBLIC OF
Visel, Friedrich, Bofferdange, LUXEMBOURG
Materne, Thierry Florent Edme, Viville, BELGIUM
Zimmer, Rene Jean, Howald, LUXEMBOURG
Lauer, Wolfgang, Mersch, LUXEMBOURG
Weydert, Marc, Luxembourg, LUXEMBOURG
Schildbach, Thomas, Eischen, LUXEMBOURG
Lechtenbohmer, Annette, Ettelbruck, LUXEMBOURG
Klinkenberg, Maurice Peter Catharina Jozef, Gosseldange, LUXEMBOURG
PI US 2002068796 A1 20020606
AI US 2001-912208 A1 20010724 (9)
PRAI US 2000-222723P 20000803 (60)
DT Utility
FS APPLICATION
LREP The Goodyear Tire & Rubber Company, Patent & Trademark Department - D/823, 1144 East Market Street, Akron, OH, 44316-0001
CLMN Number of Claims: 12
ECL Exemplary Claim: 1
DRWN No Drawings
LN.CNT 734
CAS INDEXING IS AVAILABLE FOR THIS PATENT.
AB There is disclosed a pneumatic tire having a rubberized component comprising:

(a) 100 parts by weight of at least one rubber containing olefinic unsaturation; and

(b) 1 to 50 phr of a dendrimer.

CLM What is claimed is:

1. A pneumatic tire having a rubber component made from a rubber composition comprising (a) 100 parts by weight of at least one rubber containing olefinic unsaturation; and (b) 1 to 50 phr of a **dendrimer**.

2. The pneumatic tire of claim 1 wherein said **dendrimers** have a functionally active **terminal** moiety selected from the group consisting of carboxyl, vinyl, aryl, aziridenyl, oxazolinyl, haloalkyl, oxiranyl, hydroxy, isocyanato, amine, carboxylic ester moieties, trialkoxysilane, acrylate, methacrylate and **polyethylene** oxide.

3. The pneumatic tire of claim 1 wherein said **dendrimer** is selected from the group consisting of polyamidoamine **dendrimers** , polyether **dendrimers**, polysulfide **dendrimers**, polyaminosulfide **dendrimers**, carbosilane based **dendrimers**, hydrocarbon and polysiloxane **dendrimers**.

4. The pneumatic tire of claim 1 wherein said **dendrimer** is made via the polycondensation of cyclic anhydrides with diisopropanolamine.

5. The pneumatic tire of claim 1 wherein the number of generations range from 2 to 12.

6. The pneumatic tire of claim 1 wherein said rubber is selected from the group consisting of natural rubber, neoprene, polyisoprene, butyl rubber, halobutyl rubber, polybutadiene, styrene-butadiene copolymer, styrene/isoprene/butadiene rubber, methyl methacrylate-butadiene copolymer, isoprene-styrene copolymer, methyl methacrylate-isoprene copolymer, acrylonitrile-isoprene copolymer, acrylonitrile-butadiene copolymer, carboxylated rubber, EPDM, silicon-coupled star-branched polymers, tin-coupled star-branched polymers and mixtures thereof.

7. The pneumatic tire of claim 1 wherein from 0.5 to 20 phr of a sulfur containing organosilicon compound is present and is of the formula: Z--Alk--S.sub.n--Alk--Z in which Z is selected from the group consisting of ##STR3## where R.sup.1 is an alkyl group of 1 to 4 carbon atoms, cyclohexyl or phenyl; R.sup.2 is alkoxy of 1 to 8 carbon atoms, or cycloalkoxy of 5 to 8 carbon atoms; Alk is a divalent hydrocarbon of 1 to 18 carbon atoms and n is an integer of 2 to 8.

8. The pneumatic tire of claim 1 wherein said composition is thermomechanically mixed at a rubber temperature in a range of from 140° C. to 190° C. for a total mixing time of from 1 to 20 minutes.

9. The pneumatic tire of claim 1 wherein said tire is selected from the group consisting of race tires, passenger tires, aircraft tires, agricultural, earthmover, off-the-road and truck tires.

10. The pneumatic tire of claim 1 where said tire is a radial.

11. A pneumatic tire of claim 1 wherein said rubber component is selected from the group consisting of tread, sidewall, apex, chafer, sidewall insert, wirecoat and innerliner.

12. The pneumatic tire of claim 11 wherein said component is a tread.

L10 ANSWER 16 OF 19 USPATFULL on STN
AN 2002:130050 USPATFULL
TI Dendritic materials for enhanced performance of energy storage devices
IN Newkome, George R., Apollo Beach, FL, United States
Moorefield, Charles N., Tampa, FL, United States
PA The University of South Florida, Tampa, FL, United States (U.S. corporation)

PI US 6399717 B1 20020604
WO 9948950 19990930
AI US 2000-646737 20001122 (9)
WO 1999-US6706 19990326
20001122 PCT 371 date
PRAI US 1998-79413P 19980326 (60)
DT Utility
FS GRANTED
EXNAM Primary Examiner: Lipman, Bernard
LREP Kohn & Associates
CLMN Number of Claims: 22
ECL Exemplary Claim: 1
DRWN 30 Drawing Figure(s); 14 Drawing Page(s)
LN.CNT 545
CAS INDEXING IS AVAILABLE FOR THIS PATENT.
AB There is provided dendritic materials for enhanced performance of an energy storage device having a unimolecular micelle including branched building blocks. Also provided is an energy storage device having a lithium source, a hydrocarbon dendrimer based electrolyte made up of a unimolecular micelle including branched building blocks, insertional electrode, and a current conductor.
CLM What is claimed is:

1. Dendritic materials for enhanced performance of an energy storage device, comprising a unimolecular micelle electrolyte including branched building blocks capable of triggered electrochemical discharge.

2. The dendritic materials according to claim 1, wherein said branched building blocks include **polyethylene** glycol functionalized, highly saturated branches.

3. The dendritic materials according to claim 1, wherein said dendritic materials have improved electrolyte stability.

4. The dendritic materials according to claim 1, wherein said dendritic materials have more efficient Lithium-ion transport.

5. The dendritic materials according to claim 1, wherein said dendritic materials have a decreased electrolyte layer thickness.

6. The dendritic materials according to claim 5, wherein said dendritic materials have greater specific energy, energy density, and battery cycle life.

7. The dendritic materials according to claim 1, wherein said dendritic materials further include linearly positioned neuromolecular arrays.

8. The dendritic materials according to claim 7, wherein said dendritic materials are grown on polyalkyn-based molecular wires.

9. The dendritic materials according to claim 1, wherein said unimolecular micelles further include logical constraints for controlling dynamic movement.

10. The dendritic materials according to claim 9, wherein said dynamic movement is torsional for allowing **terminal** units to be either adjacent or separated dependent upon the torsional movement.

11. The dendritic material according to claim 9, wherein said dyanmic movement is controlled by a guest molecule.

12. The dendritic material according to claim 11 wherein said dendritic material includes lipophilic centers, said guest being disposed within said lipophilic centers.

13. The dendritic material according to claim 12 wherein said guest is a counter ion selected from the group consisting essentially of CI, Br.sup.-, I.sup.-, (PF.sub.6).sup.- and **dendrimer**-based polyions.

14. The dendritic material according to claim 13 wherein said polyion is C(CH.sub.2OCH.sub.2CH.sub.2CONHC(CH.sub.2CH.sub.2CO.sub.2.sup.-K.sup.+).sub.3).sub.4).

15. The dendritic material according to claim 9, wherein said logical constraints include at least one from the group consisting of site-specific molecular recognition, disruption of internal H-bonding and swelling in void regions.

16. The dendritic materials according to claim 1, wherein said dendritic materials made polymetallic regions.

17. The dendritic material according to claim 16 wherein the polymetallic material is selected from the group consisting essentially of hexagonal, square, linear, sheet-like, three dimensional and octahedral shapes.

18. The dendritic material according to claim 17 including connectors that assist in defining geometry, said connections selected from the group consisting of bipyridal- and terpyridal-based ligands.

19. The dendritic material according to claim 16 wherein said ligands accommodate metals selected from the group consisting of Cu, Fe, Ru, Os, Zn, Co, Ni, Mn, Pd, Pt, Rh, Re, W, In, Au, and Ag.

20. An energy storage device comprising: a lithium source; a hydrocarbon **dendrimer**-based electrolyte of claim 1; an insertion electrode; and a current conductor.

21. A method of controlling dynamic movement of a **dendrimer** by inserting a guest into the **dendrimer**.

22. A method of improving magneto resistive and giant magneto resistive disk drive heads by: incorporating metallodendrimers and cyclic metal arrays into magneto resistive and giant metallo resistive disk drive heads and increasing resistance and enhancing signal detection of the heads to improve performance of byte reading and detection based on electron flow pathway dispersion.

L10 ANSWER 17 OF 19 USPATFULL on STN
AN 2001:188700 USPATFULL
TI Cyclodextrin polymer compositions for use as drug carriers
IN Kosak, Kenneth M., West Valley City, UT, United States
PI US 2001034333 A1 20011025
AI US 2001-775011 A1 20010201 (9)
RLI Continuation-in-part of Ser. No. WO 1999-US30820, filed on 27 Dec 1999, UNKNOWN Continuation-in-part of Ser. No. US 1998-223055, filed on 30 Dec 1998, GRANTED, Pat. No. US 6048736
DT Utility
FS APPLICATION
LREP KENNETH M. KOSAK, 3194 S. 4400 W., West Valley City, UT, 84120
CLMN Number of Claims: 23
ECL Exemplary Claim: 1
DRWN No Drawings
LN.CNT 2761
CAS INDEXING IS AVAILABLE FOR THIS PATENT.
AB This invention discloses compositions of cyclodextrin polymers for carrying drugs and other active agents. Compositions are also disclosed of cyclodextrin polymer carriers that release drugs under controlled conditions. The invention also discloses compositions of cyclodextrin polymer carriers that are coupled to biorecognition molecules for targeting the delivery of drugs to their site of action.

The advantages of the water-soluble cyclodextrin polymer carrier are:

(1) Drugs can be used based on efficacy without solubility or

conjugation requirements.

(2) Drugs can be delivered as macromolecules and released within the cell.

(3) Drugs can be targeted by coupling the carrier to biorecognition molecules.

(4) Synthesis methods are independent of the drug to facilitate multiple drug therapies.

CLM What is claimed is:

1. A controlled release pharmaceutical composition comprising; a) cyclodextrin molecules selected from the group consisting of cyclodextrin derivatives, oxidized cyclodextrins, cyclodextrin dimers, cyclodextrin trimers, and cyclodextrin polymers complexed with; b) an active agent selected from the group consisting of prodrugs, anticancer drugs, antineoplastic drugs, antifungal drugs, antibacterial drugs, antiviral drugs, cardiac drugs, neurological drugs, alkaloids, antibiotics, bioactive peptides, steroids, steroid hormones, polypeptide hormones, interferons, interleukins, narcotics, prostaglandins, purines, pyrimidines, anti-protozoan drugs and anti-parasitic drugs wherein; c) said cyclodextrin molecules are covalently cross-linked through a biocleavable linkage to form a polymer that has entrapped the active agent and wherein the cross-linking provides the function of controlled release.

2. The composition of claim 1 wherein the biocleavable linkage is selected from the group consisting of disulfide linkages, protected disulfide linkages, ester bonds, aldehyde bonds, amide bonds, polypeptide linkages and hydrazone linkages.

3. The composition of claim 1 further comprising a biorecognition molecule coupled to the pharmaceutical composition.

4. The composition of claim 1 wherein said cyclodextrin dimers, cyclodextrin trimers, and cyclodextrin polymers have been derivatized to provide groups selected from the group consisting of dialdehydes, sulfobutylethers, sulfopropylethers, hydroxyethyls, hydroxypropyls, dihydroxy propyls, carboxylates and phosphates.

5. The composition of claim 1 wherein the active agent is selected from the group consisting of ganciclovir, furosemide, indomethacin, camptothecins, cyclosporins, chlorpromazine, methotrexate, penicillin derivatives, anthracyclines, teramycins, tetracyclines, chlorotetracyclines, clomocyclines, butoconazole, ellipticines, guamecyclines, macrolides, filipins, fungichromins, nystatins, 5'-fluorouracil, 5'-fluoro-2'-deoxyuridine, allopurinol and paclitaxe.

6. The composition of claim 1 wherein said cyclodextrin molecules are coupled to an intermediate coupling substance selected from the group consisting of serum albumins, glycoproteins, lipoproteins, polysaccharides, lipopolysaccharides, amino polysaccharides, polyacrylamides, lipids, glycolipids, N-(2-hydroxypropyl) methacrylamides, poly cyanoacrylates, **polyethylene** glycols, poly (D,L-lactic-coglycolic adds), **dendrimers**, poly (D,L-lactide)-block-methoxypolyethylene glycols and magnetic particles.

7. A controlled release pharmaceutical composition comprising; a) cyclodextrin molecules selected from the group consisting of cyclodextrin derivatives, oxidized cyclodextrins, cyclodextrin dimers, cyclodextrin trimers, and cyclodextrin polymers complexed with; b) nucleic acid, wherein; c) said cyclodextrin molecules are covalently cross-linked through a biocleavable linkage to form a polymer that has entrapped the active agent and wherein the cross-linking provides the function of controlled release.

8. The composition of claim 7 wherein the biocleavable linkage is selected from the group consisting of disulfide linkages, protected

disulfide linkages, ester bonds, aldehyde bonds, amide bonds, polypeptide linkages and hydrazone linkages.

9. The composition of claim 7 further comprising a biorecognition molecule coupled to the pharmaceutical composition.

10. The composition of claim 7 wherein said cyclodextrin dimers, cyclodextrin trimers, and cyclodextrin polymers have been derivatized to provide groups selected from the group consisting of dialdehydes, sulfobutylethers, sulfopropylethers, hydroxyethyls, hydroxypropyls, dihydroxy propyls, carboxylates and phosphates.

11. The composition of claim 7 wherein the nucleic add is selected from the group consisting of DNA, RNA, sense and antisense oligonucleotides; sense and antisense oligodeoxynucleotides; sense and antisense oligonucleotides and oligodeoxynucleotides containing phosphodiesters, phosphorothioates, phosphorodithioates, phosphoroamidates, alkyl phosphotriesters, methylphosphonates, sulfamates, 3'-thioformacetals, methylene(methylimino)s, 3'-N-carbamates, and morpholino carbamates; synthetic nucleic add polymers, phosphoric acid ester nucleic acids and peptide nucleic acids.

12. The composition of claim 7 wherein said cyclodextrin molecules are coupled to an intermediate coupling substance selected from the group consisting of serum albumins, glycoproteins, lipoproteins, polysaccharides, lipopolysaccharides, amino polysaccharides, polyacrylamides, lipids, glycolipids, N-(2-hydroxypropyl) methacrylamides, poly cyanoacrylates, **polyethylene** glycols, poly (D,L-lactic-coglycolic acids), **dendrimers**, poly (D,L-lactide)-block-methoxypolyethylene glycols and magnetic particles.

13. A controlled release pharmaceutical composition comprising; a) cyclodextrin molecules selected from the group consisting of cyclodextrin derivatives, oxidized cyclodextrins, cyclodextrin dimers, cyclodextrin trimers, and cyclodextrin polymers complexed with; b) toxin, wherein; c) said cyclodextrin molecules are covalently cross-linked through a biocleavable linkage to form a polymer that has entrapped the active agent and wherein the cross-linking provides the function of controlled release.

14. The composition of claim 13 wherein the biocleavable linkage is selected from the group consisting of disulfide linkages, protected disulfide linkages, ester bonds, aldehyde bonds, amide bonds, polypeptide linkages and hydrazone linkages.

15. The composition of claim 13 further comprising a biorecognition molecule coupled to the pharmaceutical composition.

16. The composition of claim 13 wherein said cyclodextrin dimers, cyclodextrin trimers, and cyclodextrin polymers have been derivatized to provide groups selected from the group consisting of dialdehydes, sulfobutylethers, sulfopropylethers, hydroxyethyls, hydroxypropyls, dihydroxy propyls, carboxylates and phosphates.

17. The composition of claim 13 wherein the active agent is selected from the group consisting of aflatoxins, ricins, bungarotoxins, irinotecan, pesticides, cevadines, desatrines, veratridine and cevine derivatives.

18. The composition of claim 13 wherein said cyclodextrin molecules are coupled to an intermediate coupling substance selected from the group consisting of serum albumins glycoproteins, lipoproteins, polysaccharides, lipopolysaccharides, amino polysaccharides, polyacrylamides, lipids, glycolipids, N-(2-hydroxypropyl) methacrylamides, poly cyanoacrylates, **polyethylene** glycols, poly (D,L-lactic-coglycolic acids), **dendrimers**, poly (D,L-lactide)-block-methoxypolyethylene glycols and magnetic particles.

19. A pharmaceutical amylose composition comprising; a) amylose selected from the group consisting of amylose segments, amylose derivatives, oxidized amylose and amylose polymers complexed with; b) an active agent, wherein; c) said amylose is covalently cross-inked to form a polymer that has entrapped the active agent.

20. A biocleavable crosslinking agent comprising; a) a compound containing a biocleavable linkage selected from the group consisting of polypeptide linkages and hydrazone linkages wherein; b) said compound has **terminal** reactive coupling groups selected from the group consisting of N-succinimidyls, N-maleimidyls, p-nitrophenyl esters, iodoacetals, bromoacetals, oxiranes and imidoesters.

21. A method for producing a cyclodextrin pharmaceutical composition comprising combining cyclodextrin molecules selected from the group consisting of cyclodextrin derivatives, cyclodextrin dimers, cyclodextrin trimers, and cyclodextrin polymers with; a) guest molecules coupled to a surface to form an inclusion complex between the cyclodextrin molecules and the guest molecules on the surface, and; b) covalently cross-linking the cyclodextrin molecules to form a polymer.

22. A method for producing a cyclodextrin pharmaceutical composition using a solid support comprising coupling a first cyclodextrin molecule selected from the group consisting of cyclodextrin derivatives, cyclodextrin dimers, cyclodextrin trimers, and cyclodextrin polymers to a solid support through a cleavable coupling agent and; a) coupling in succession, additional cyclodextrin molecules to the first cyclodextrin molecule that is coupled to the solid support to form a polymer and; b) cleaving the first cyclodextrin molecule from the solid support.

23. A pharmaceutical catalytic agent composition comprising; a) cyclodextrin molecules selected from the group consisting of oxidized cyclodextrins, cyclodextrin dimers, cyclodextrin trimers, and cyclodextrin polymers coupled with; b) a catalytic group selected from the group consisting of carboxylates, imidazoles, histamines, hydroxyls, amines, amides, aldehydes, ketones, phosphates, sulfhydryls, halogens, amino acids, nucleic acids, chelators, and metals.

L10 ANSWER 18 OF 19 USPATFULL on STN
AN 2001:110015 USPATFULL
TI Star-branched polymer with dendrimer core
IN Agarwal, Pawan Kumar, Houston, TX, United States
Wang, Hsien-Chang, Bellaire, TX, United States
Wang, Yu Feng, Houston, TX, United States
Frechet, Jean M.J., Oakland, CA, United States
Haque, Shah A., Houston, TX, United States
PI US 2001007897 A1 20010712
US 6545101 B2 20030408
AI US 2001-777398 A1 20010206 (9)
RLI Division of Ser. No. US 1998-100271, filed on 19 Jun 1998, GRANTED, Pat. No. US 6228978
PRAI US 1997-50727P 19970625 (60)
DT Utility
FS APPLICATION
LREP ExxonMobil Chemical Company, P.O. Box 2149, Baytown, TX, 77522-2149
CLMN Number of Claims: 28
ECL Exemplary Claim: 1
DRWN No Drawings
LN.CNT 466
CAS INDEXING IS AVAILABLE FOR THIS PATENT.
AB Polyisobutylene (PIB) functionalized with terminal reactive unsaturation is disclosed. Carbocationically polymerized monohalogen-terminated PIB is dehydrohalogenated in a hydrocarbon solvent using an alkoxide of the formula RO-M wherein R is alkyl of at least 5 carbon atoms and M is alkali metal. The PIB obtained has terminal unsaturation which is 100% in the reactive `exo` form which can be converted to succinic anhydride groups (PIB-SA) by the ene reaction with maleic anhydride. The PIB-SA is

reactive with amine functional dendrimers to obtain a star-branched polymer having a dendrimer core and PIB branches joined by succinimide linkages. Blends of the star-branched polymer with polypropylene have improved energy absorption properties and controllable moisture/oxygen permeabilities useful in films.

CLM What is claimed is:

1. A method for preparing polyisoolefins comprising the steps of: (a) dehydrohalogenating a halogen-terminated polyisoolefin in a hydrocarbon solvent in the presence of alkoxide of the formula RO-M wherein R is alkyl of at least 5 carbon atoms and M is alkali metal; and (b) recovering polyisolefin having **terminal** unsaturation.

2. The method of claim 1 wherein the dehydrohalogenation step (a) obtains polyisobutylene having a **terminal** double bond chain end in `exo` form essentially free of `endo` form.

3. The method of claim 2 wherein the polyisoolefin is monohalogen-terminated.

4. The method of claim 1 wherein the alkoxide is t-pentoxide.

5. The method of claim 4 wherein the alkoxide is potassium t-pentoxide.

6. The method of claim 1 wherein the isoolefin has from 4 to about 12 carbon atoms.

7. The method of claim 6 wherein the isoolefin is isobutylene.

8. Polyisoolefin having a **terminal** double bond chain end in `exo` form essentially free of `endo` form.

9. The polyisoolefin of claim 8 wherein the polyisoolefin comprises polyisobutylene.

10. The polyisoolefin of claim 9 having a molecular weight from 500 to 500,000.

11. The polyisoolefin of claim 10 having a molecular weight of 500 to 30,000.

12. The polyisoolefin of claim 11 having a molecular weight of 500 to 20,000.

13. The polyisoolefin of claim 10 having a molecular weight of 20,000 to 500,000.

14. A method for preparing functionalized polyisoolefins comprising the steps of: (a) dehydrohalogenating a halogen-terminated polyisoolefin in a hydrocarbon solvent in the presence of alkoxide of the formula RO-M wherein R is alkyl of at least 5 carbon atoms and M is alkali metal; (b) reacting the product from step (a) with maleic anhydride, and (c) recovering PIB-SA.

15. A method for preparing a hydrolytically stable star-branched polymeric material having a **dendrimer** core and polyolefin branches, comprising the steps of: (a) reacting a functionalized polyolefin with a hydrolytically stable **dendrimer** having primary amine functionality in an outer core, and (b) recovering star-branched polymeric material.

16. The star-branched polymeric material prepared by the method of claim 15.

17. A hydrolytically stable star branched polymeric material comprising a hydrolytically stable **dendrimer** core with branches of polyolefin.

18. The star branched polymeric material of claim 17 wherein the

polyolefin is a polyisoolefin.

19. The star-branched material of claim 18 wherein the polyisoolefin is polyisobutylene.

20. The star branched polymeric material of claim 19 wherein at least two polyisobutylene branches have different molecular weights.

21. The star branched polymeric material of claim 19 wherein the polyisobutylene branches have a molecular weight between 500 and 20,000.

22. The star branched polymeric material of claim 17 comprising a mixture of **dendrimer** cores of at least 2 generations.

23. The star branched polymeric material of claim 19 also comprising branches of **polyethylene**, polypropylene or ethylene-propylene copolymer.

24. The star branched polymeric material of claim 17 wherein the polyolefin is a alpha-olefin polymer.

25. A composition comprising a blend of polyalpha-olefins with a star-branched polymer comprising a hydrolytically stable **dendrimer** core with branches of a polyisoolefin, polyalpha-olefins or a mixture of polyisoolefins and polyalpha-olefins.

26. The composition of claim 25 wherein polyalpha-olefin is selected from **polyethylene**, polypropylene, ethylene-propylene copolymers, and polyisobutylene.

27. The composition of claim 25 wherein the polyolefin is polypropylene prepared with a metallocene based catalyst.

28. A film comprising polyolefin blended with a star branched polymeric material comprising a hydrophilic **dendrimer** core with branches comprising a polyisoolefin.

L10 ANSWER 19 OF 19 USPATFULL on STN
AN 2000:117327 USPATFULL
TI Self-assembling polynucleotide delivery system comprising dendrimer polycations
IN Szoka, Jr., Francis C., San Francisco, CA, United States
Haensler, Jean, Petite Rosselle, France
PA The Regents of the University of California, Oakland, CA, United States (U.S. corporation)
PI US 6113946 20000905
AI US 1995-469433 19950606 (8)
RLI Continuation of Ser. No. US 1993-92200, filed on 14 Jul 1993, now abandoned which is a continuation-in-part of Ser. No. US 1992-913669, filed on 14 Jul 1992, now abandoned which is a continuation-in-part of Ser. No. US 1992-864876, filed on 3 Apr 1992, now abandoned
DT Utility
FS Granted
EXNAM Primary Examiner: Brusca, John S.; Assistant Examiner: Larson, Thomas G.
LREP Koenig, Nathan P.Crosby, Heafey, Roach & May
CLMN Number of Claims: 64
ECL Exemplary Claim: 1
DRWN 13 Drawing Figure(s); 8 Drawing Page(s)
LN.CNT 2326
CAS INDEXING IS AVAILABLE FOR THIS PATENT.
AB A self-assembling polynucleotide delivery system comprises a dendrimer polycation aiding in the delivery of the polynucleotide to a desired address, and optionally other agents such as DNA masking agents, cell recognition agents, charge-neutralization agents, membrane-permeabilization agents, and subcellular-localization agents.
CLM What is claimed is:
1. A composition for presenting a polynucleotide to a eukaryotic cell,

comprising a polynucleotide; and a **dendrimer** polycation having **terminal** cationic groups non-covalently coupled to the polynucleotide; wherein the proportion of **terminal** cationic groups of the **dendrimer** polycation to nucleotide content of the polynucleotide is 1:1 to 223.3:1.

2. The composition of claim 1, wherein the **dendrimer** polycation comprises a core molecule comprising at least two reactive residues selected from the group consisting of hydroxyl, ester, imino, imido, halide, carboxyl, carboxyhalide, maleimide, dithiopyridyl and sulfhydryl, and combinations thereof.

3. The composition of claim 1, wherein the **dendrimer** polycation comprises a polyamidoamine.

4. The composition of claim 1, wherein the **terminal** cationic groups are selected from the group consisting of azoles and primary, secondary, tertiary and quaternary aliphatic, and aromatic amines which may be substituted with S or O, guanidium and combinations thereof.

5. The composition of claim 1, wherein the **terminal** cationic groups comprise about 10 to 100% of all **terminal** groups of the **dendrimer** polycation.

6. The composition of clainm 5, wherein the **dendrimer** polycation further comprises 0 to about 90% **terminal** reactive residues of all **terminal** groups of the **dendrimer** polycation.

7. The composition of claim 6, wherein the **terminal** reactive residues are selected from the group consisting of ester, halide, carboxyhalide, hydroxyl, cyano, carboxyl, sulfhydryl, maleimide and dithiopyridyl, and combinations thereof.

8. The composition of claim 1, wherein the **dendrimer** polycation is non-covalently associated with the polynucleotide.

9. The composition of claim 1, wherein the **dendrimer** polycation has an about 2,000 to 1,000,000 MWave.

10. The composition of claim 1, wherein the **dendrimer** polycation has a hydrodynamic radius of about 11 to 60 Å.

11. The composition of claim 1, wherein the proportion of **terminal** cationic-groups of the **dendrimer** polycation to nucleotide content of the polynucleotide is about 1:1 to 25:1.

12. The composition of claim 1, further comprising a membrane-permeabilizing agent, wherein the membrane-permeabilizing agent is coupled to the **dendrimer** polycation.

13. The composition of claim 12, wherein the proportion of the membrane permeabilizing agent to **terminal** cationic groups of the **dendrimer** polycation is about 1:100 to 1:4.

14. The composition of claim 12, wherein the membrane-permeabilizing agent comprises an amphipathic peptide.

15. The composition of claim 14 wherein the amphipathic peptide assumes a pH-dependent α-helix conformation.

16. The composition of claim 15 wherein the amphipathic peptide α-helix comprises a first and a second axial face such that the first face is substantially charged and the second face is substantially neutral.

17. The composition of claim 16 wherein the first face is negatively charged.

18. The composition of claim 17, wherein the amphipathic peptide comprises GALA/SEQ ID NO:11.

19. The composition of claim 14, wherein the peptide comprises an amphipathic peptide which assumes a β-pleated sheet conformation.

20. The composition of 19 wherein the β-pleated sheet amphipathic peptide has a first and second face such that the first face is positively charged and the second face is substantially neutral.

21. The composition of claim 20, wherein the peptide comprises a cyclic peptide.

22. The composition of claim 21, wherein the cyclic peptide is selected from the group consisting of gramicidin S and tyrocidines.

23. The composition of claim 22, wherein the cyclic peptide comprises gramicidin S.

24. The composition of claim 12, further comprising a phospholipid.

25. The composition of claim 24, wherein the phospholipid comprises phosphatidylethanolamine.

26. The composition of claim 25, wherein the phosphatidylethanolamine comprises dioleoylphosphatidylethanolamine.

27. The composition of claim 24, wherein the phospholipid is present in the form of liposomes.

28. The composition of claim 12, further comprising an additional polycation.

29. The composition of claim 28, wherein the polycation comprises a polyamine.

30. The composition of claim 29, wherein the polyamine is selected from the group consisting of polylysine, polyarginine, polyornithine, spermine, spermidine, 3,3'-diamino-bispropylamine, iminobis(N,N)-dimethylpropylamine, iminobis(3-aminopropyl)-1,3-propanediamine, and cationic **dendrimers**.

31. The composition of claim 12, wherein the membrane-permeabilizing agent comprises a cationic bile salt of chemical formula ##STR14## wherein X and Y are independently H or OH; R.sup.3 is H, (C.sub.1 -C.sub.10)alkyl or (C.sub.1 -C.sub.10)alkylamine; and R.sup.4 is a positively charged linear or branched (C.sub.1 -C.sub.30)alkyl or (C.sub.1 -C.sub.30)alkylamine, wherein one or more of the carbon atoms may be substituted with NR', wherein R' is H, (C.sub.1 -C.sub.10)alkyl or (C.sub.1 -C.sub.10)alkylamine.

32. The composition of claim 1, further comprising a subcellular-localization agent, wherein the subcellular-localization agent is coupled to the **dendrimer** polycation.

33. The composition of claim 32, wherein the proportion of the subcellular-localization agent to **terminal** cationic groups of the **dendrimer** polycation is about 1:100 to 1:5.

34. The composition of claim 32, wherein the subcellular-localization agent comprises a nuclear localization agent.

35. The composition of claim 34, wherein the nuclear localization agent is coupled to a DNA-associating moiety.

36. The composition of claim 35 wherein the polynucleotide-associating moiety comprises a plurality of linker strands.

37. The composition of claim 36 wherein substantially the entire linker strand sequence is complementary to the desired polynucleotide.

38. The composition of claim 36 wherein the linker strand comprises an extension of the desired polynucleotide.

39. The composition of claim 36 wherein the linker strand has a sequence with a plurality of regions, each region complementary to a portion of the desired polynucleotide.

40. The composition of claim 35 wherein the polynucleotide-associating moiety comprises a first linker complementary to the desired polynucleotide and a second linker complimentary to the desired polynucleotide.

41. The composition of claim 35, wherein the polynucleotide-associating moiety comprises an intercalating agent.

42. The composition of claim 41, wherein the intercalating agent has the chemical formula ##STR15## wherein Z comprises a bond, a reactive group selected from the group consisting of N-hydroxysuccinimide, maleimide, maleimidophenyl, pyridyl disulfide, hydrazide, and phenylglyoxal, or ZY, wherein Y is selected from the groups consisting of cell surface receptor ligands, nuclear localization sequences, and membrane permeabilizing components; n and m are independently an integer of 1 to 20; p is an integer of 0 to 20; and Ar.sub.1 and Ar.sub.2 are independently selected from the groups consisting of ethidium bromide, acridine, mitoxantrone, oxazolopyridocarbazole, ellipticine, N-methyl-2,7-diazapyrenium, and derivatives thereof.

43. The composition of claim 42, wherein Ar.sub.1 and Ar.sub.2 comprise acridine.

44. The composition of claim 43, wherein Z comprises maleimidophenyl or dithiopyridyl.

45. The composition of claim 42, wherein Z comprises the group ##STR16##

46. The composition of claim 41, wherein the intercalating agent is coupled to at least one ligand comprising a cell recognition agent.

47. The composition of claim 46, further comprising a membrane-permeabilizing agent coupled to the intercalating agent or the ligand.

48. The composition of claim 41, wherein the intercalating agent has the chemical formula

49. The composition of claim 35, wherein the polynucleotide-associating moiety comprises a linker strand complimentary to the desired polynucleotide.

50. The composition of claim 35, wherein the polynucleotide-associating moiety comprises a major- or minor-groove binder.

51. The composition of claim 1, further comprising a cell recognition agent coupled to the **dendrimer** polycation.

52. The composition of claim 51, wherein the proportion of cell recognition agent to **terminal** cationic groups of the **dendrimer** polycation is about 1:100 to 1:10.

53. The composition of claim 51, wherein the cell recognition agent is selected from the group consisting of vitamins, carbohydrates, and polypeptides.

54. The composition of claim 53, wherein the polypeptide comprises an

antibody or fragment thereof.

55. The composition of claim 51, further comprising a membrane-permeabilizing agent coupled to the cell recognition agent.

56. The composition of claim 1, further comprising a fusogenic polypeptide, wherein the fusogenic polypeptide is coupled to the **dendrimer** polycation.

57. The composition of claim 56, wherein the proportion of fusogenic polypeptide to **terminal** cationic groups of the **dendrimer** polycation is about 1:100 to 1:4.

58. The composition of claim 1, further comprising a DNA masking agent which increases the circulatory half-life of the polynucleotide, wherein the DNA masking agent is coupled to the **dendrimer** polycation.

59. The composition of claim 58, wherein the proportion of DNA masking agent to **terminal** cationic groups of the **dendrimer** polycation is about 1:33 to 1:3.

60. The composition of claim 58, wherein the DNA masking agent is coupled to a DNA-associating moiety.

61. The composition of claim 58, wherein the DNA-masking agent has the chemical formula wherein n is an integer of 6 to 24; Y is selected from the group consisting of hydroxy, sialyl, ethanolamine, choline, glycerol, serine, monomethoxypolyethylene glycol, and inositol; R.sup.1 is (C.sub.6 -C.sub.24)alkyl or (C.sub.6 -C.sub.24)alkenyl; R.sup.3 is H, or (C.sub.1 -C.sub.10)alkyl or (C.sub.1 -C.sub.10)alkylamine; and R.sup.4 is a positively charged linear or branched (C.sub.1 -C.sub.30)alkyl or alkylamine, wherein one or more of the carbon atoms may be substituted with NR', wherein R' is H, (C.sub.1 -C.sub.10)alkyl or (C.sub.1 -C.sub.10)alkylamine.

62. The composition of claim 58, wherein the masking agent comprises **polyethylene** glycol (PEG).

63. The composition of claim 1, wherein the polynucleotide comprises a hybrid vector comprising a structural gene coupled thereto.

64. The composition of claim 1, in solid, liquid or aerosol form.